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DURUM WHEAT



QUALITY REPORT

Physical, Chemical, Milling, and Macaroni Characteristics

1969 C R O P

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION

and

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF CEREAL TECHNOLOGY

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION
in cooperation with
STATE AGRICULTURAL EXPERIMENT STATIONS

QUALITY EVALUATION OF DURUM WHEAT VARIETIES

1969 CROP^{1/}

by

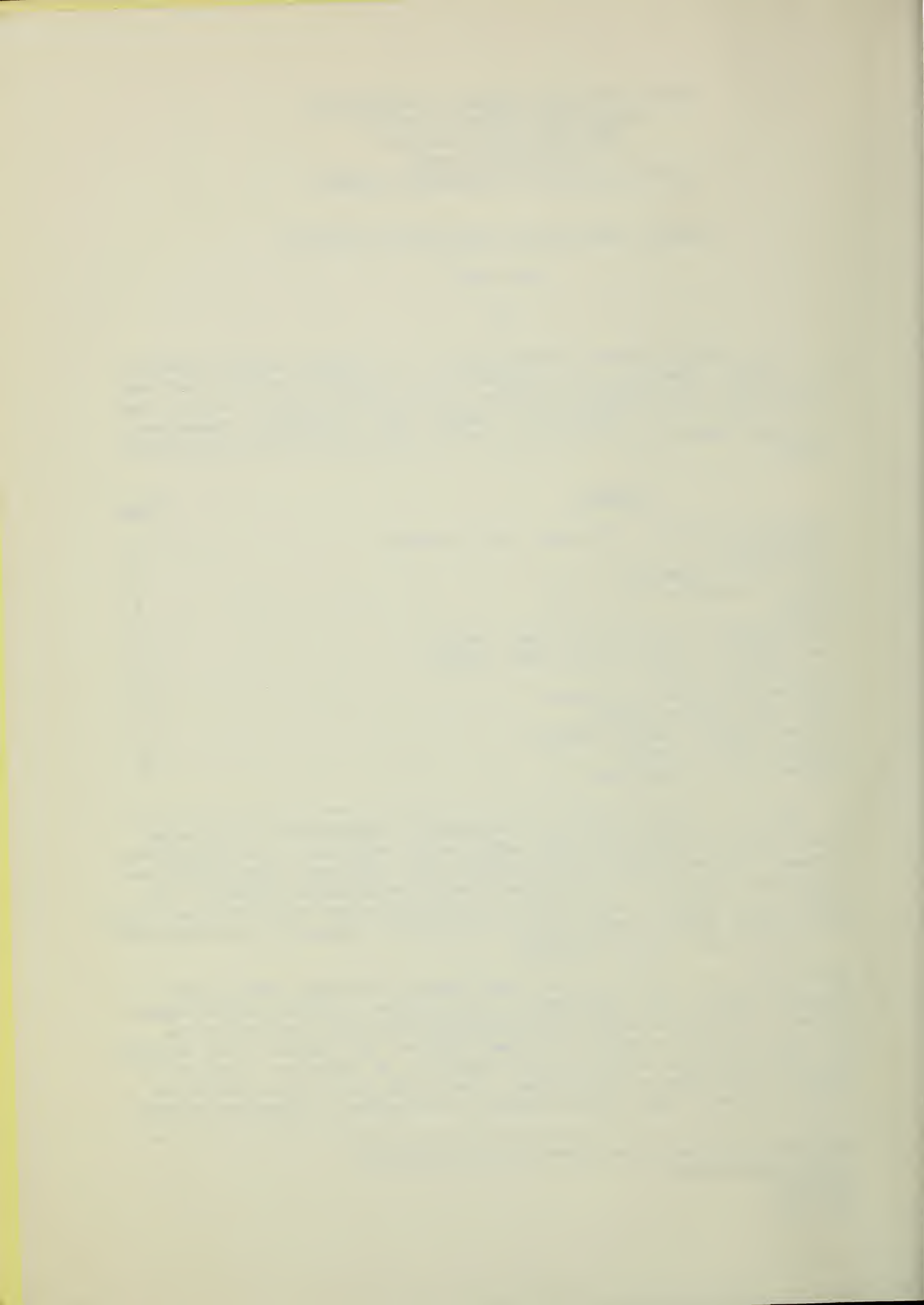
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^{1/} This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled in the Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations or quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

Hard Red Spring and Durum Wheat Quality Laboratory
Fargo, North Dakota
CR-45-70
May 1970



COOPERATING AGENCIES, STATIONS, AND PERSONNEL

The cooperating agencies, stations, and personnel conducting the varietal plot and nursery experiments concerned with these durum tests in 1969 were as follows:

Minnesota Agricultural Experiment Station:

Crookston, Morris, and St. Paul: R. E. Heiner*,
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Montana Agricultural Experiment Station:

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North Dakota Agricultural Experiment Station:

Carrington, Dickinson, and Williston: L. Joppa*,
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Oregon State University:

Pendleton: W. H. Foote, C. R. Rohde, and J. T. McDermid.

South Dakota Agricultural Experiment Station:

Bison, Brookings, Eureka, Highmore, Wall, and Watertown:
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Othello: Lawrence Bacon, John Dickey, and C. F. Konzak.

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INTRODUCTION

This, the eighth annual Durum Wheat Quality Report, is for the 1969 crop. Samples of standard varieties and new strains of durum wheat grown in cooperative experiments in the durum wheat region of the United States^{2/} were milled and evaluated by the Hard Red Spring and Durum Wheat Quality Laboratory in cooperation with the Department of Cereal Chemistry and Technology on the campus of North Dakota State University at Fargo, North Dakota. The evaluation of the field plot and some advanced durum wheats is integrated with the work done by the Department of Cereal Chemistry and Technology of North Dakota State University. Methods and techniques are described in detail in the text of the report.

Where sufficient quantity of sample was available, the semolina was processed into spaghetti to determine the quality characteristics. When the quantity was insufficient, only the dry slick test was employed. In previous years the mixogram or farinogram value was given for the samples tested. However, because the test was time consuming and of little consequence in the outcome of the general evaluation, it was abandoned.

The purpose of this report is to make available to cooperators the quality data on standard varieties and new strains of durum wheat from the 1969 crop.

The relatively new milling and slick test adopted in this report is more fully described under the Milling, the Color Score, and Dry Slick Color Score in the Methods Section. A statistical study of results, comparing the dry slick method and other established evaluation methods was given in the section of Statistical Study of the Dry Slick Color Score in the 1963 Report (CR-59-64). A new method using a Buhler experimental mill and Miag laboratory purifier was employed to process the macro samples of durum wheat.

^{2/} Heiner, R. "Results on Spring Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1969." Crops Research Division, ARS, USDA, CR-36-70.

SOURCE OF THE SAMPLES

Two hundred and fifty-two samples were received from 19 stations in six states -- Minnesota, Montana, North Dakota, Oregon, South Dakota, and Washington -- for durum wheat quality tests. Approximately 25% of the samples tested were the named commercial varieties of Lakota, Langdon, Leeds, Mindum, Sentry, and Wells. The remaining samples were either new varieties or samples received from a special test for quality evaluation.

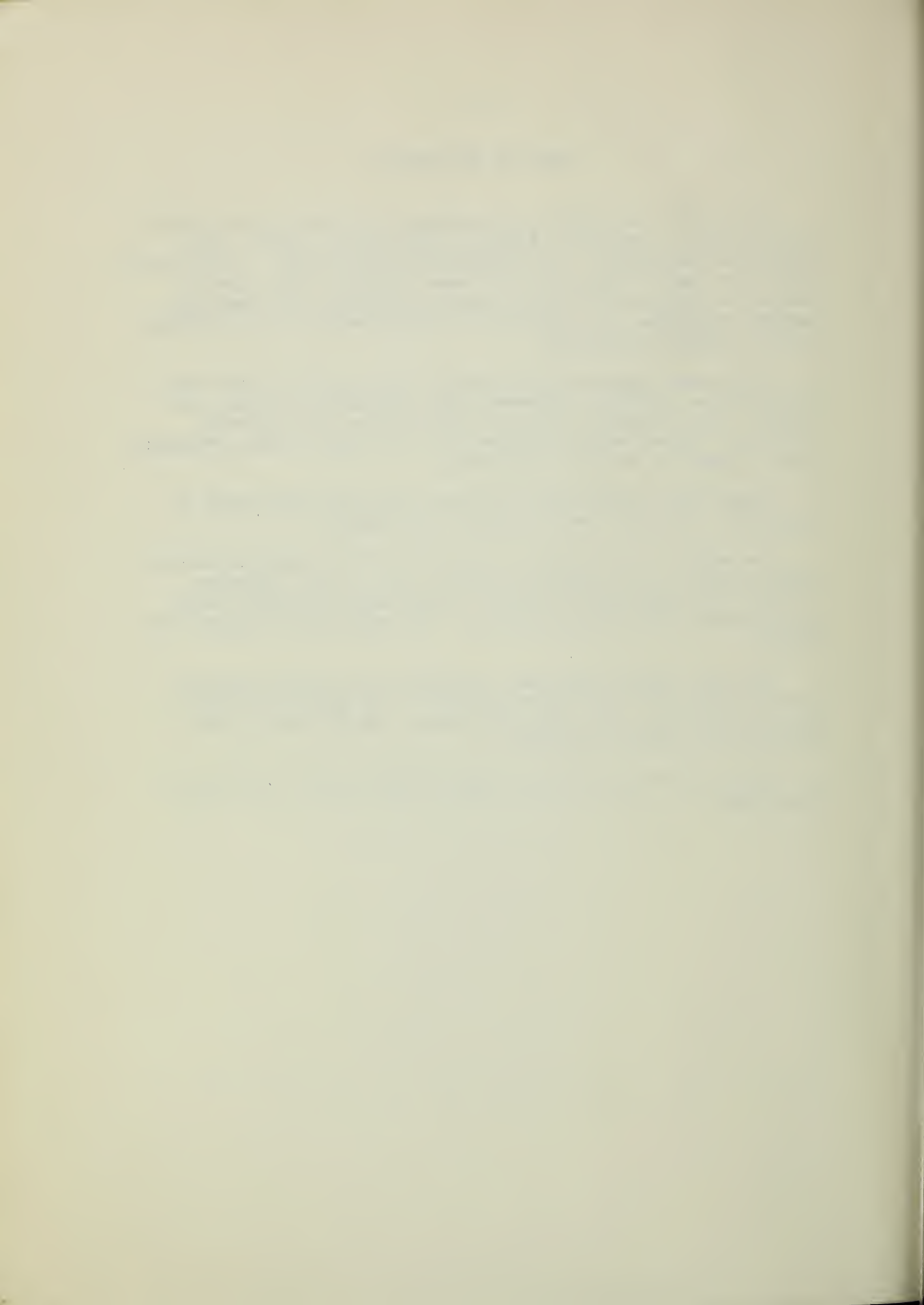
Forty-seven Advanced Yield Nursery samples were received from five stations in Montana (Bozeman, Havre, Kalispell, Moccasin, and Sidney); the Carrington station in North Dakota; the Pendleton station in Oregon, and six stations in South Dakota (Bison, Brookings, Eureka, Highmore, Wall, and Watertown).

Twenty-eight samples were received from Field Plots grown at Carrington, Dickinson, and Williston, North Dakota.

One hundred and forty-one samples were Uniform Regional Nursery samples grown at the Crookston, Morris, and St. Paul, Minnesota stations; Carrington and Dickinson, North Dakota stations; Eureka and Watertown, South Dakota stations. No samples were received from Montana.

The durum wheats which were included in the Uniform Regional Nursery 1969 trials are listed on Page 5. The variety or cross, the C.I. number or state selection number, and the station which developed the variety are given.

Thirty-six Special Nursery samples were received from Othello, Washington.



UNIFORM REGIONAL DURUM NURSERY

| Entry No. | Cross or Variety | C.I. or Sel. No. | Year Entered | Source |
|--------------|--|---------------------|-----------------|-------------|
| 1 | Mindum | 5296 | 1929 | Minnesota |
| 2 | Wells | 13333 | 1957 | USDA-N.Dak. |
| 3 | Leeds | 13768 | 1963 | " |
| 4 | Hercules | DT191 | 1966 | Canada |
| 5 | Lk*2/Pelissier | DT316 | 1968 | " |
| 6 | " | DT317 | " | " |
| 7 | Ld393/2*Ldn/3/Ld398// Ld357*2/St464 | D6517 | " | USDA-N.Dak. |
| 8 | 61-130/Lds | D6580 | 1969 | " |
| 9 | Lds//Ldn/Br134 | D6586 | 1968 | " |
| 10 | 60-62/61-42 | D6674 | 1969 | " |
| 11 | " | D6676 | " | " |
| 12 | " | D6678 | " | " |
| 13 | 61-130/61-42 | D6687 | " | " |
| 14 | " | D6688 | " | " |
| 15 | " | D6690 | " | " |
| 16 | 61-130/Lds** | D6647 | " | " |
| 17 | " ** | D6654 | 1968 | " |
| 18 | " ** | D6655 | " | " |
| 19 | " ** | D6659 | 1969 | " |
| 20 | " ** | D6660 | " | " |

** Semidwarf types.

METHODS

The methods used in the testing of the samples were essentially the same as given in last year's report, with the addition of some new tests and interpretations of the tests, as well as deletions.

Briefly, the following methods and terminologies were applied:

Test Weight Per Bushel - The weight per Winchester bushel of dockage-free wheat.

Thousand Kernel Weight - The 1000 kernel weight was determined by counting the number of kernels in a 10 g. sample of cleaned, picked wheat with an Asco Seed Counter^{3/}.

Kernel Size - The percentage of the size of the kernels (large, medium, and small) was determined on a wheat sizer as described by Shuey^{4/}.

The sieves of the sizer were clothed as follows:

| | | |
|--------------|---|---------------------------------|
| Top Sieve | - | Tyler # 7 with 2.92 mm. opening |
| Middle Sieve | - | Tyler # 9 with 2.24 mm. opening |
| Bottom Sieve | - | Tyler #12 with 1.65 mm. opening |

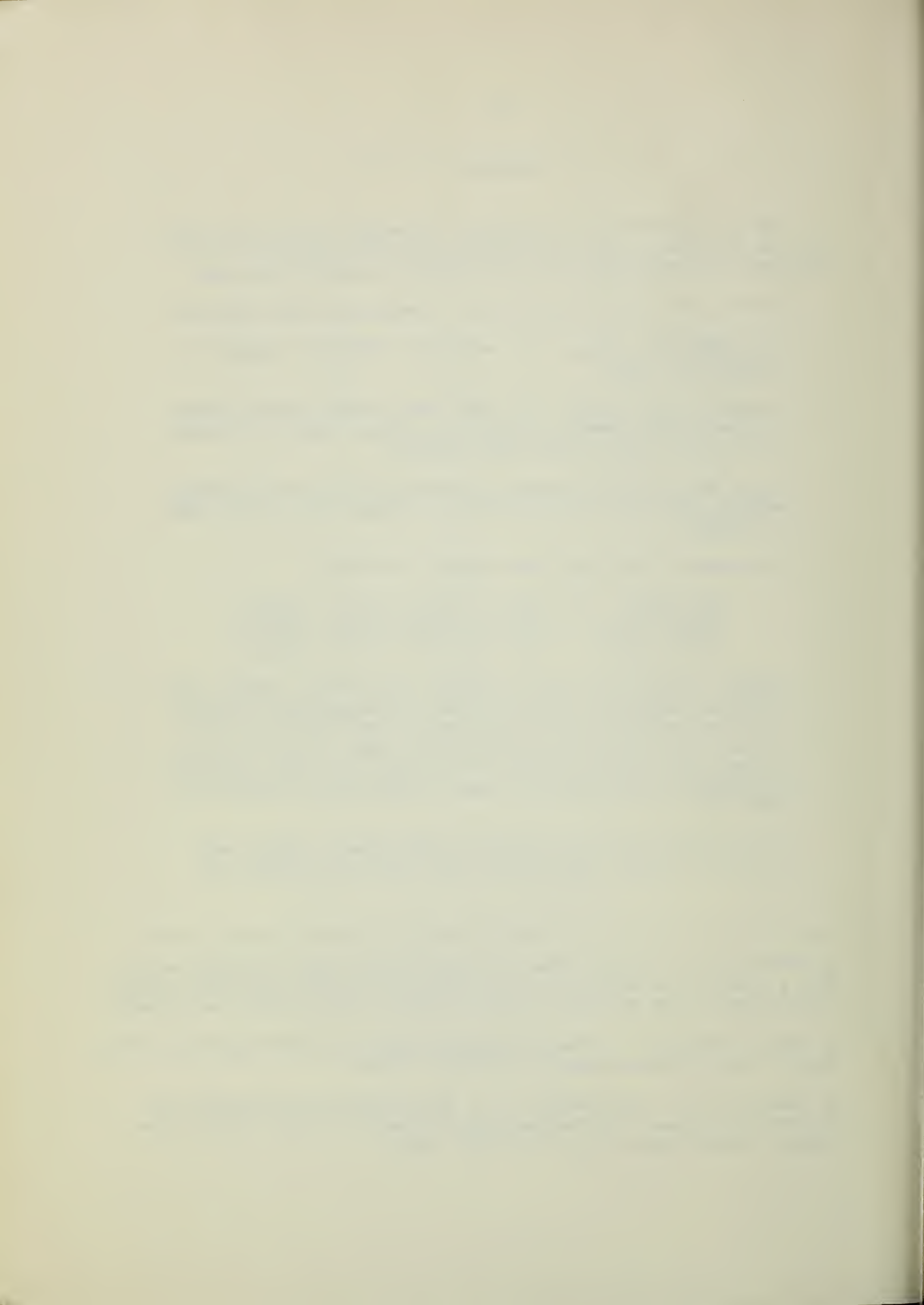
Milling - Some of the large advanced yield nursery samples were milled and tested in cooperation with the Department of Cereal Chemistry and Technology, North Dakota State University. The dockage-free wheat was tempered in two stages; first to 13.5% moisture for 18 hours, then to 15-1/2% one hour before milling. The method is essentially the same as described by Harris and Sibbitt^{5/}.

The field plot and large advanced yield nursery samples were milled on a Buhler experimental mill specially designed for

^{3/} Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the USDA, and does not imply its approval to the exclusion of other products that may also be suitable.

^{4/} Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5: 71-72,75 (1960).

^{5/} Harris, R. H., and Sibbitt, L. D. Experimental Durum Milling and Processing Equipment with Further Quality Studies on North Dakota Durum Wheats. Cereal Chemistry 19: 388-402 (1942).



milling durum wheat. The mill is equipped with corrugated rolls throughout and the semolina purified on a Miag laboratory purifier. All of the stock is handled pneumatically. A flow diagram for the mill is shown on Page 10. The clean dry wheat was tempered in three stages: first to 12.5% moisture at least 72 hours prior to the second stage which is to add an additional 2.0% for 18 hours to give a cumulative moisture of 14.5%, then a final temper of 3.0%, 45 minutes prior to milling.

The other samples were milled on a modified Brabender Quadrumat Jr. Mill. The #4 roll was replaced by a wooden blank plug. The drum sieve was clothed with #18 wire. The throughs of the #18 wire were sifted on a Strand sifter equipped with a #30 Tyler sieve. The sample was tempered to 12.5% and allowed to stand for at least 72 hours. After the sample was properly tempered for the required length of time to 12.5% moisture, the sample was again tempered to 13.5% and allowed to stand over night. An additional 2.5% moisture was added to the sample one-half to three-fourths hour before milling. The sample was sifted on the Tyler wire for one minute. The throughs of the #30 wire were classified as unpurified semolina. This material was used in testing the quality of the semolina.

Protein Content - The protein was calculated by multiplying by the factor of 5.7, the percent nitrogen, as determined by the standard Kjeldahl procedure.

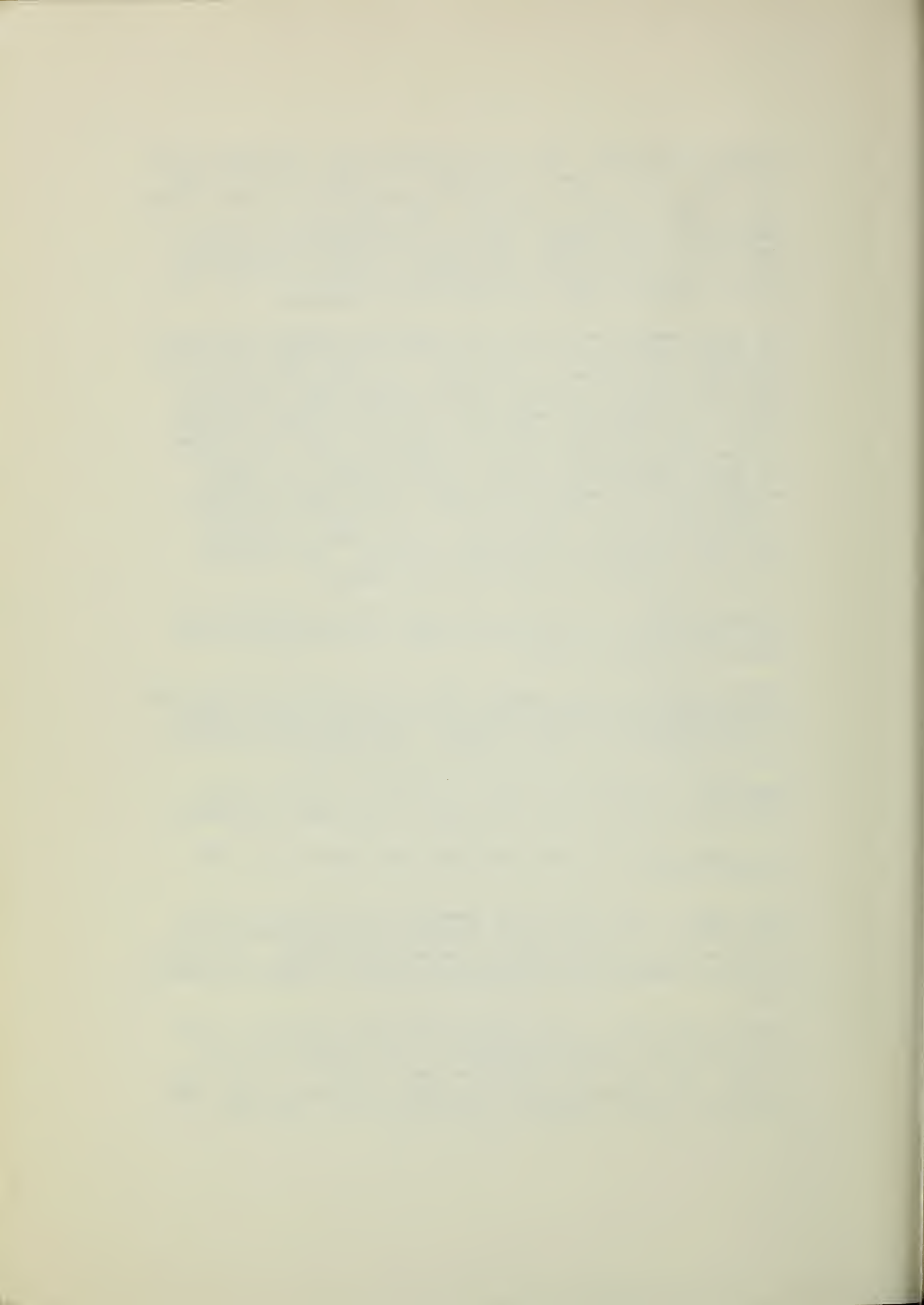
Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 600°C. The results were reported as percentage of the sample which was incinerated.

Absorption - This was the water, expressed as percent of the semolina required to bring the dough to the proper consistency.

All values (protein, ash, absorption) are reported on a 14% moisture basis.

Color Score - The color of the spaghetti or semolina has been generally accepted as the most important single grading factor. A deep amber or golden color is the most preferable. The amount of yellow pigmentation determines the extent or degree of amber-ness.

Samples which have a color rating below 8 for spaghetti and 80 for slick color are unsatisfactory. It is possible that the average color score for a crop year may be higher or lower than average, therefore, this would be taken into consideration when giving the overall rating of a variety for that given year. A



sample may receive a low rating for reasons other than a deficiency of yellow pigmentation such as: D - Dullness; G - Grayness; R - Redness; B - Branny; W - White Cast or Chalkiness; and S - Speckiness, or a combination of these factors. The sample will be rated accordingly with the exception of the intensity, quantity, and depth of the yellow pigmentation.

The following grading system has been adopted for scoring the color of spaghetti and semolina:

COLOR SCORE

| <u>Spaghetti</u> | <u>Dry Slick</u> | <u>Description</u> |
|------------------|------------------|---|
| 12 | 105 | Much deeper and intense yellow pigmentation than standard. |
| 11 | 100 | Deeper and more intense yellow pigmentation than standard. |
| 10 | 90 | Standard quality, depth and intensity of yellow pigmentation. |
| 9 | 85 | Slightly less depth and intensity, but sufficient quantity of pigmentation. |
| 8 | 80 | Slightly less quantity as well as depth and intensity of pigmentation than the standard, but still sufficient to be rated satisfactory on the basis of color. |
| 7 | 70 | Sufficiently less quantity of yellow pigmentation than the standard to give a pale yellow color and graded unsatisfactory for color score. |
| 6 | 60 | Sufficiently less quantity of yellow pigmentation than the standard to give a very pale yellow color. |
| 5 | 50 | Only a sufficient quantity of yellow pigmentation to indicate an off-white color with a yellow hue. |

The numerical rating describes the depth or amount of pigmentation.

In cases where a sample is graded down because of off-color, speckiness, etc., the designation is shown by a letter abbreviation following the numerical score. For example: 4 W would indicate the sample was chalky white with little or no yellow pigmentation; 6 D would indicate that the sample had some yellow pigmentation, but was dull.

Dry Slick Color Score - This is determined by slicking the sample with a standard of known color rating and comparing the two.

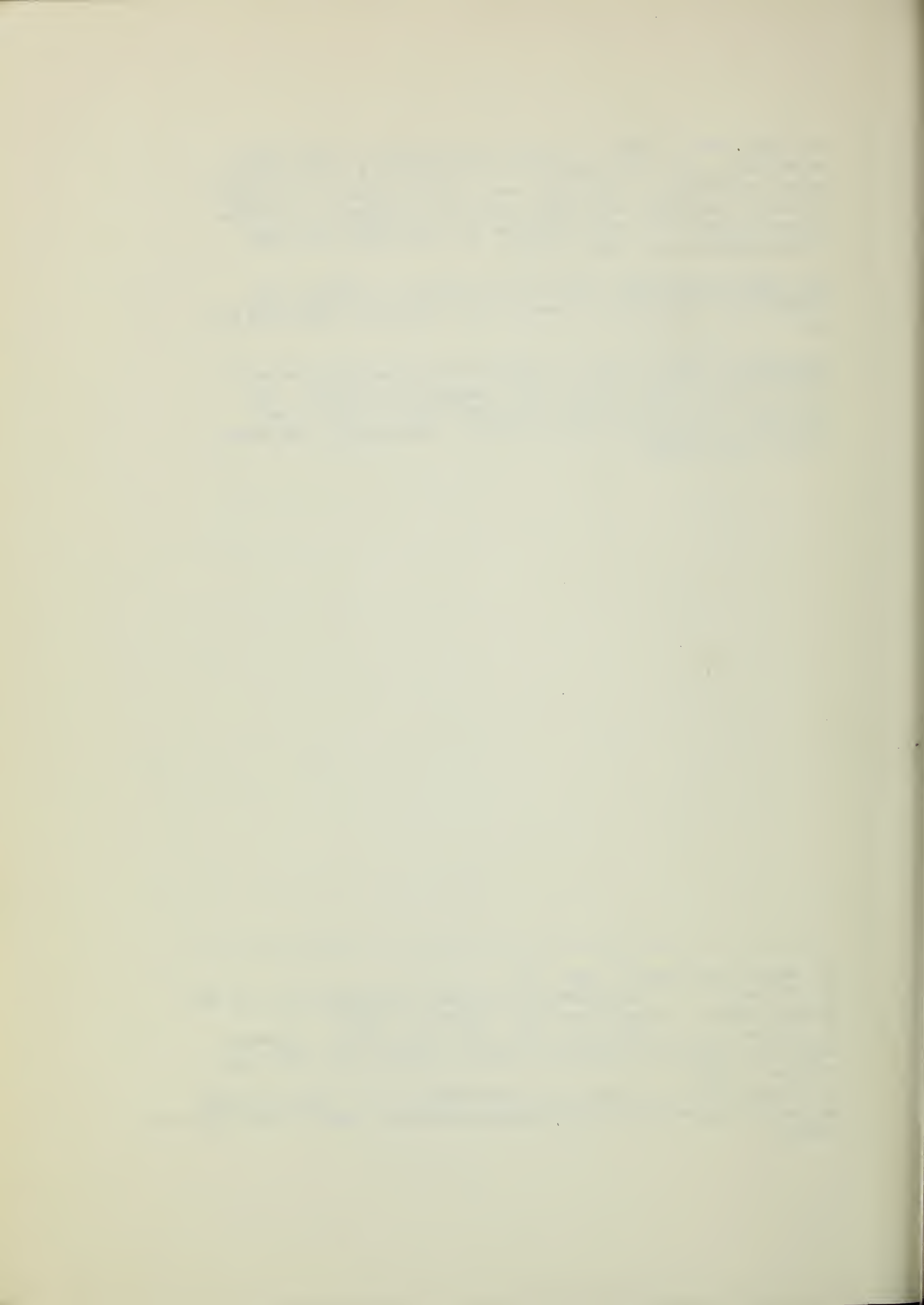
Spaghetti - Thirty grams of semolina were mixed with water to form a stiff dough, pressed into spaghetti and dried. The equipment and procedure have been described by Harris and Sibbitt^{5/}, Fifield^{6/}, Gilles, Sibbitt, and Shuey^{7/}, and Walsh, Gilles, and Shuey^{8/}.

^{5/} Harris and Sibbitt, loc. cit.

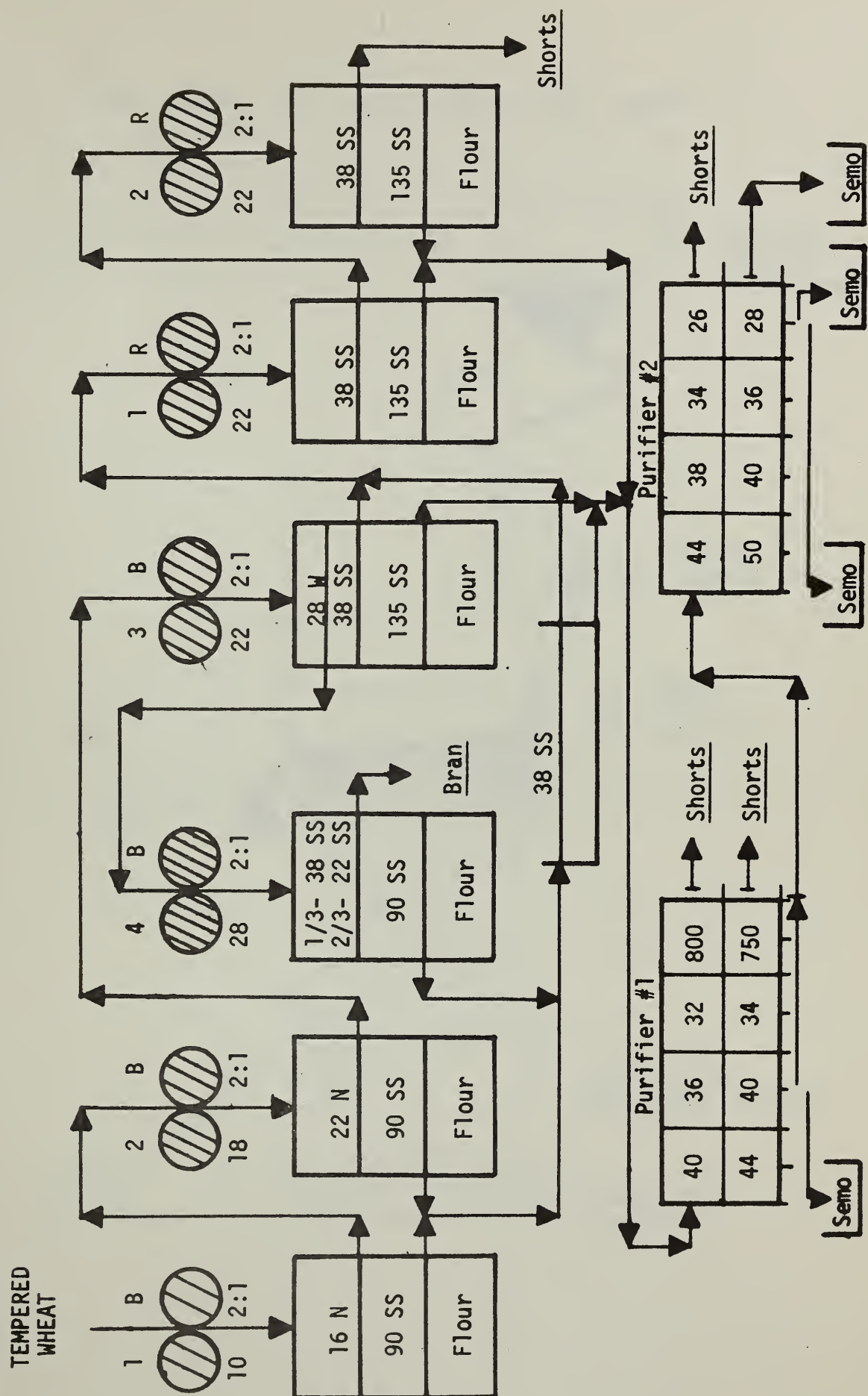
^{6/} Fifield, C. C. Experimental Equipment for Manufacture of Alimentary Pastes. Cereal Chem. 11: 330-334 (1934).

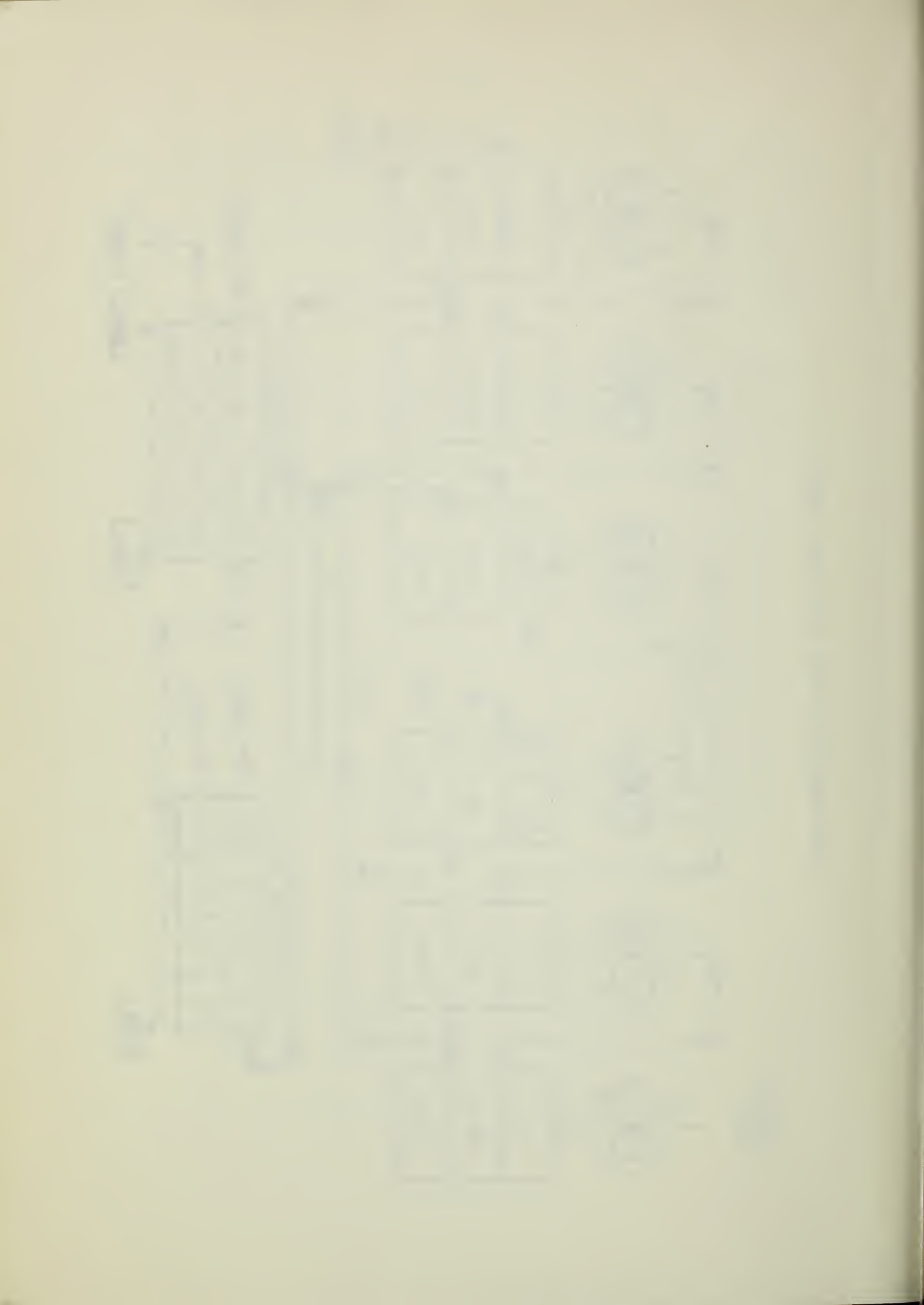
^{7/} Gilles, K. A., Sibbitt, L. D., and Shuey, W. C. Automatic Laboratory Dryer for Macaroni Products. Cereal Sci. Today 11: 322-324 (1966).

^{8/} Walsh, D. E., Gilles, K. A., and Shuey, W. C. Color Determination of Spaghetti by the Tristimulus Method. Cereal Chem. 46: 7-14 (1969).

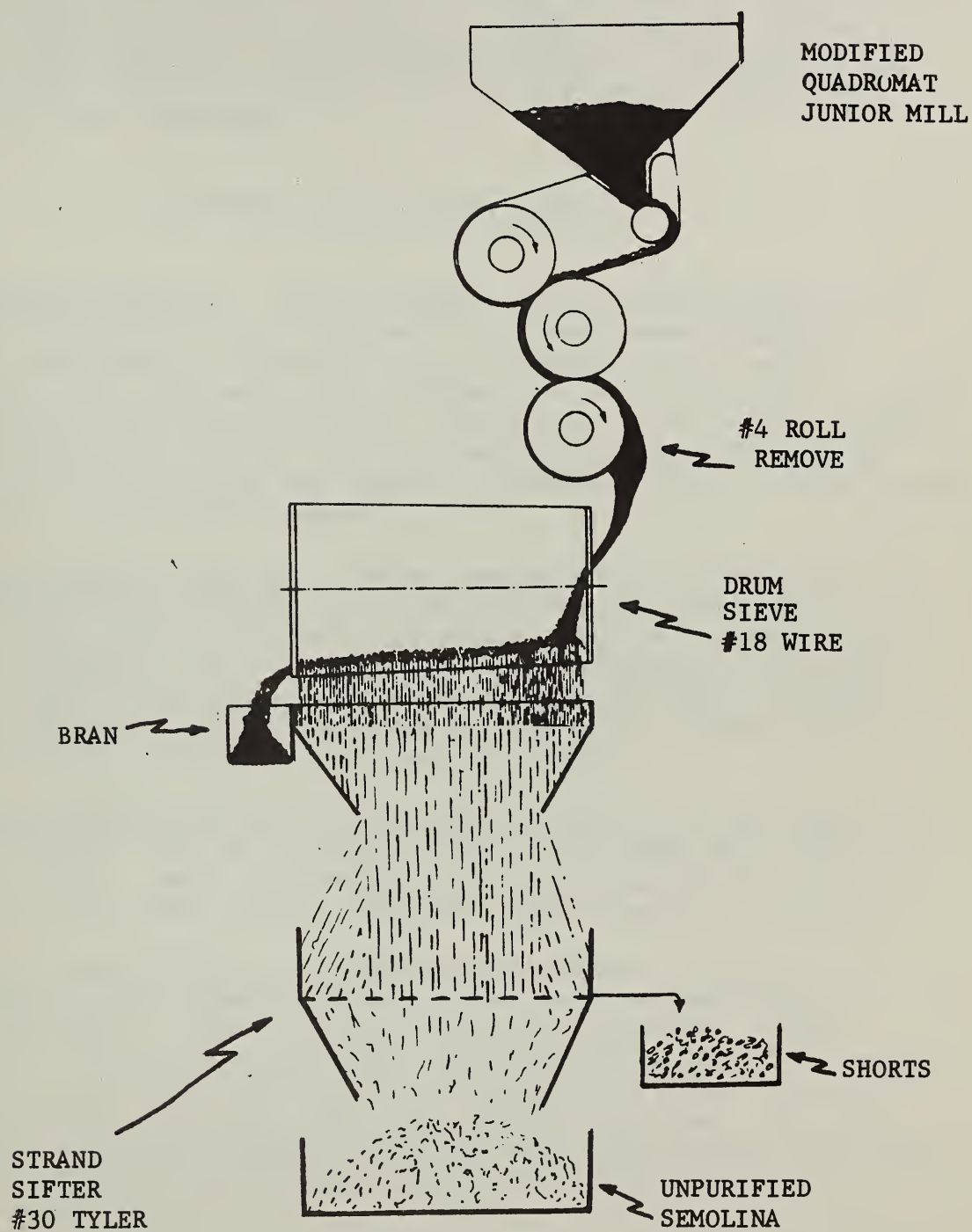


FLOW DIAGRAM FOR LARGE DURUM WHEAT SAMPLES





FLOW DIAGRAM FOR SMALL DURUM WHEAT SAMPLES



EXPERIMENTAL RESULTS

The results obtained for the 1969 crop of durum wheat samples are tabulated and presented in the following order: Tables 1 through 4 - Advanced Yield Nursery Samples; Tables 5 through 7 - Field Plot Nursery Samples; Tables 8 through 14 - Uniform Regional Nursery Samples; and Table 15 - Special Nursery Samples. Very few samples tested exhibited sprout damage, although some samples did exhibit weathering and blackpoint.

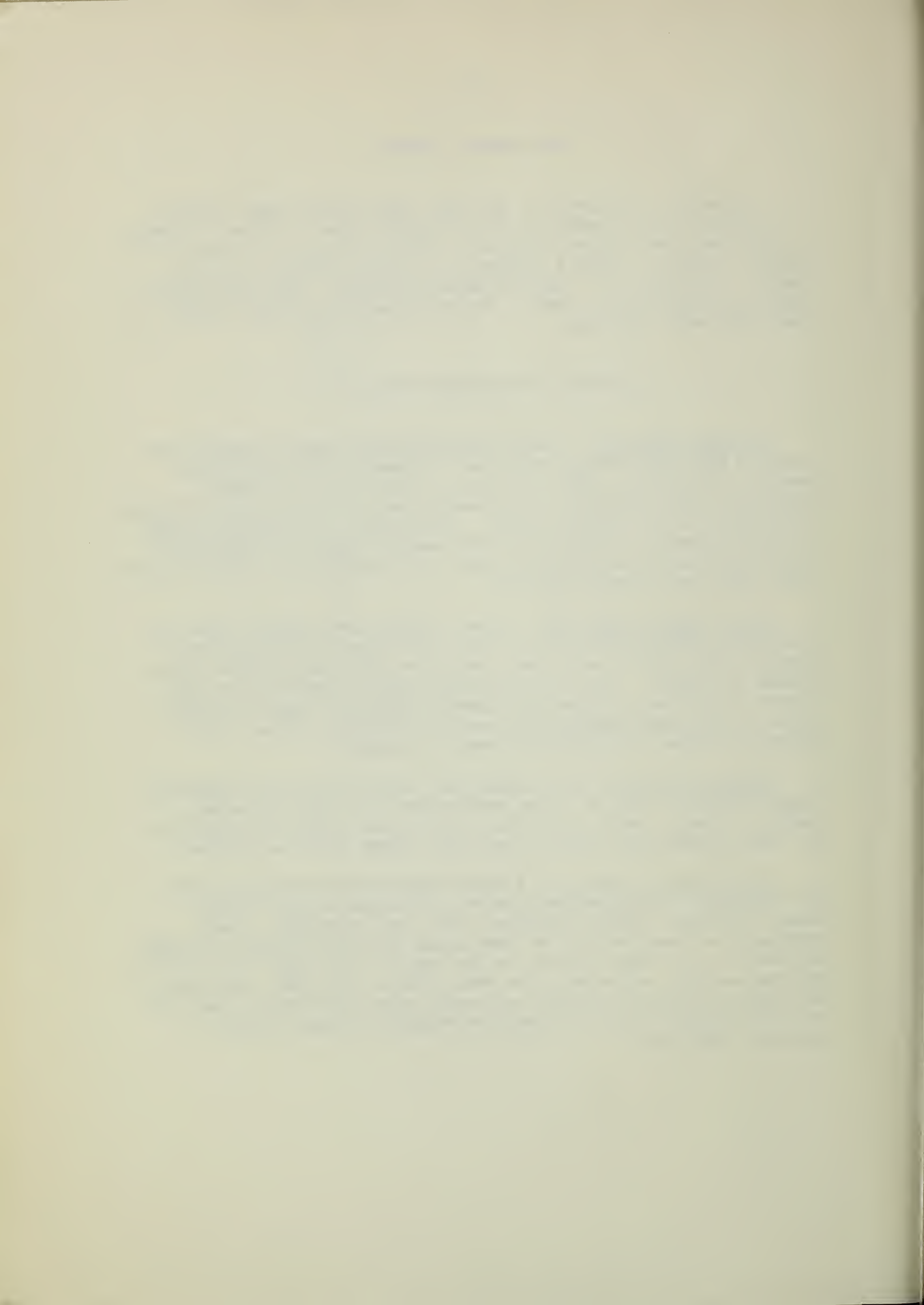
ADVANCED YIELD NURSERY SAMPLES

Montana (Table 1). Eleven advanced yield nursery samples were received from five Montana stations -- Bozeman, Havre, Kalispell, Moccasin and Sidney. The samples were comprised of two named varieties, Leeds and Wells. The samples were raised on both irrigated and dryland at the Sidney station. Comparison of the dryland versus irrigated samples at Sidney show the samples raised on dryland had better 1000 kernel weight and kernel size distribution, but less speck count than the irrigated samples.

North Dakota (Table 2). Twelve samples were received from the Carrington, North Dakota station from the advanced yield nursery. Five of these samples were named varieties, Hercules, Lakota, Leeds, Mindum, and Wells. All but two of the samples submitted from this nursery showed some promise when compared with the named varieties grown in the same nursery; they were D 6654 which showed little promise and Adur x Wells which showed no promise.

Oregon (Table 3). Six samples were received from the Pendleton, Oregon station. Four of these samples were the named varieties, Lakota, Langdon, Leeds, and Wells. Of the two selections submitted, No. 69167 showed good promise, while No. 69166 showed no promise.

South Dakota (Table 4). Eighteen samples were received from the advanced yield nurseries from six locations in South Dakota -- Bison, Brookings, Eureka, Highmore, Wall, and Watertown. These samples were comprised of the three named varieties, Hercules, Leeds, and Wells. The Leeds variety, on the average, had higher test weight, protein content, and color score than Wells or Hercules. Hercules had higher 1000 kernel weight and kernel size distribution than Leeds or Wells and both Leeds and Hercules yielded a higher percent of semolina than Wells.



FIELD PLOT NURSERY SAMPLES

North Dakota (Tables 5, 6, & 7). Twenty-eight field plot samples were received from three stations in North Dakota -- Carrington, Dickinson, and Williston. Thirteen of these samples were the named varieties, Hercules, Lakota, Leeds, Mindum, and Wells. Selections D 6517 and D 6580 were grown at all three locations and show good promise. The selection Adur x Wells shows no promise with poor color and was grown only at the Carrington station. Selections D 6586, D 6659, and D 6687 show some promise; the former two having somewhat poorer color while the latter is down in test weight and percent purified semolina. Selection D 6654 has little promise with minimum color. The last four selections were grown at both Carrington and Williston.

UNIFORM REGIONAL NURSERY SAMPLES

Minnesota (Tables 8, 9, & 10). Sixty samples were received from three stations in Minnesota -- Crookston, Morris, and St. Paul. Twelve of the samples were the named varieties, Hercules, Leeds, Mindum, and Wells. The St. Paul samples were bleached.

North Dakota (Tables 11 & 12). Forty-one samples were received from the two stations in North Dakota -- Carrington and Dickinson. Eight of these samples were the named varieties, Hercules, Leeds, Mindum, and Wells and an extra cross, Adur x Wells, was also submitted from Carrington.

South Dakota (Tables 13 & 14). Forty samples were received from two stations in South Dakota -- Eureka and Watertown. Eight of these samples were the named varieties, Hercules, Leeds, Mindum, and Wells.

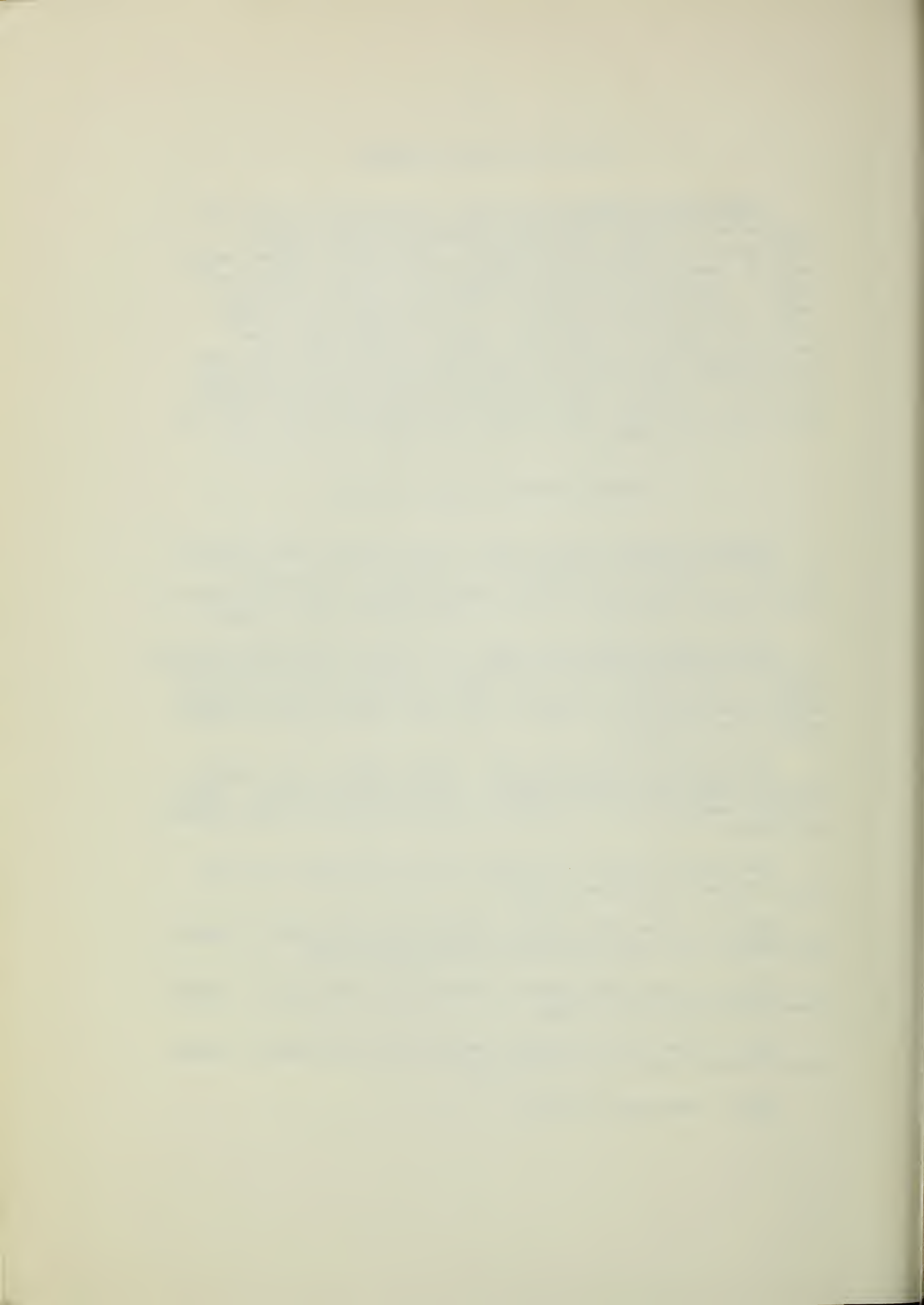
The overall general evaluation for the varieties from the three states is indicated below:

DT 316 - shows some promise, based on two crop years' results has minimum test weight and kernel size distribution.

DT 317 - shows good promise, based on two crop years' results does have minimum test weight.

.6517 - shows little promise, based on two crop years' results this selection would show no promise.

.6580 - shows some promise.



6586 - shows some promise, based on two crop years' results
this selection shows some promise as a new variety.

6647 - shows little promise, having minimum color.

6654 - shows some promise, based on two crop years' results
this selection would show little promise because of erratic results.

6655 - shows some promise, based on two crop years' results
this selection would show little promise because of erratic results.

6659 - shows some promise, tends to have minimum color.

6660 - shows little promise because of erratic results.

6674 - shows good promise.

6676 - shows good promise.

6678 - shows some promise.

6687 - shows some promise.

6688 - shows some promise.

6690 - shows some promise.

SPECIAL NURSERY SAMPLES

Washington (Table 15). Thirty-six samples were received from the Othello, Washington station. Five of these samples were the named varieties, Lakota, Langdon, Leeds, Sentry, and Wells.

Five of the selections showed no promise: K 6800702, K 680717, K 6800726, K 6800727, and K 6800741.

Ten of the selections showed little promise: WA 005288, NDD 06639, NDD 06644, NDD 66102, K 6800714, K 6800718, K 6800728, K 6800729, K 6800738, and K 6800744.

Fourteen of the selections showed some promise: WA 005289, WA 005463, WA 005544, M 6300018, M 6300037, WA 005462, D 6300008, NDD 06647, NDD 06655, NDD 06659, NDD 06660, K 6800703, K 6800708, and K 6800719.

Two of the selections showed good promise: WA 005290 and K 6800707.

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TABLE 1

QUALITY DATA ON MONTANA ADVANCED YIELD DURUM WHEAT NURSERY SAMPLES

Irrigated and Dryland

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Sem. Pro. 2/ % | Pur. Sem. 3/ % | Ash 2/ % | Specks/ 10 Sq.In. | Sem. Abs. 2/ % | Vis. Color 4/ % |
|------------------------------|----------|---------------------|--------------|-------------|----------|-------------------------|-------------------------|-------------------------|----------------|----------------------|-------------------------|--------------------------|
| | | | | Lg. | Med. Sm. | | | | | | | |
| | | | | % | % | | | | | | | |
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1/ Unofficial

2/ 14% Moisture Basis

3/ Purified

4/ Below 8 color score not acceptable.

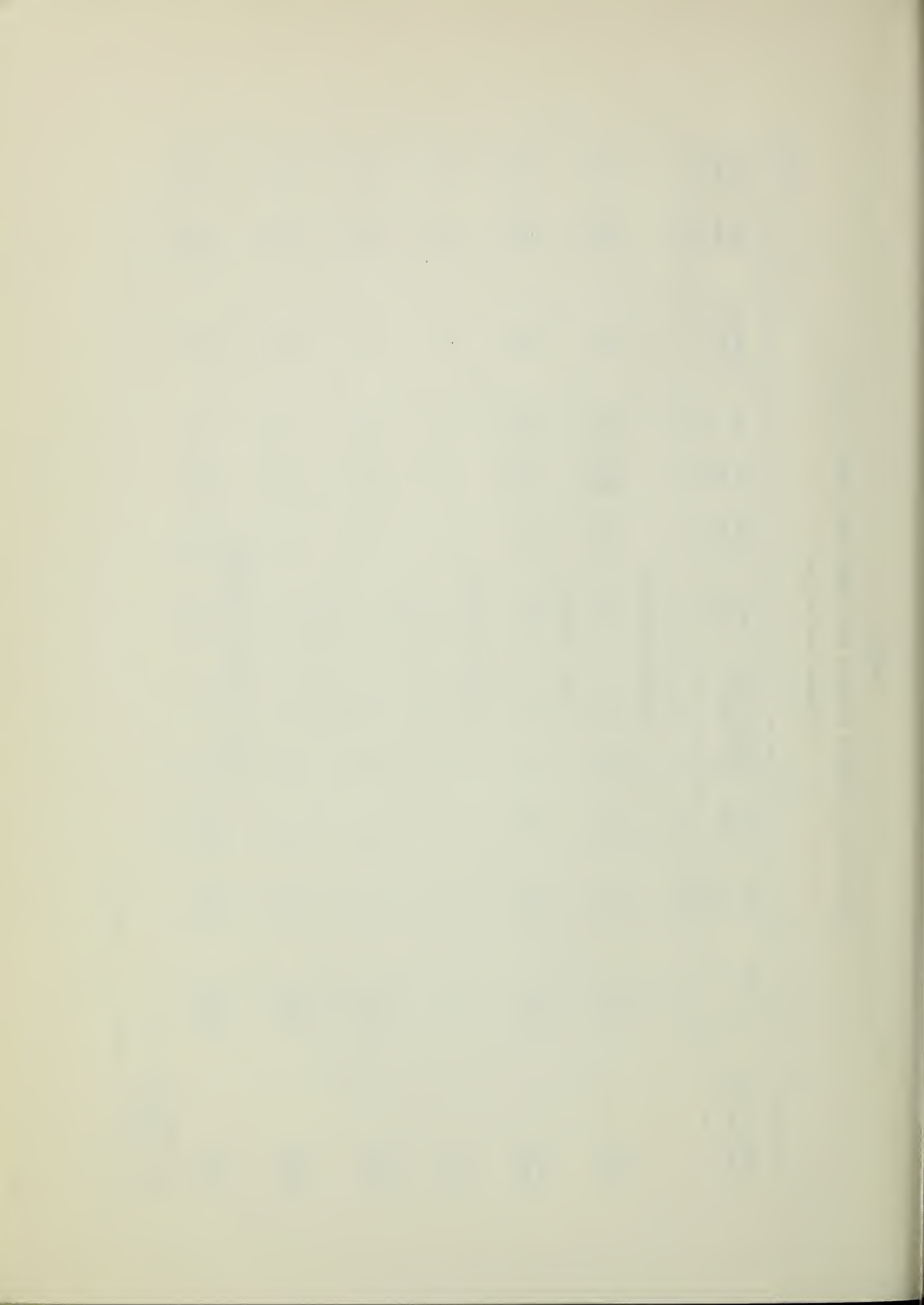


TABLE 2

QUALITY DATA ON ADVANCED YIELD DURUM WHEAT NURSERY SAMPLES

Carrington, North Dakota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ % | Gen. Eval. 5/ % |
|------------------------------|----------|---------------|--------------|-------------|------|-------------------------|---------------------|---------------------------|--------------------------|
| | | | | Lg. | Med. | | | | |
| | | | g. | % | % | | | | |
| Hercules | | 62.0 | 43.3 | 55 | 43 | 2 | 15.1 | 83 | |
| Lakota | 13335 | 59.0 | 31.3 | 11 | 83 | 6 | 14.6 | 85 | |
| Leeds | 13768 | 64.5 | 41.0 | 51 | 48 | 1 | 16.3 | 88 | |
| Mindum | 5296 | 64.0 | 37.3 | 27 | 70 | 3 | 14.2 | 81 | |
| Wells | 13333 | 61.5 | 32.7 | 21 | 75 | 4 | 15.1 | 84 | |
| D 6517 | | 62.0 | 41.5 | 51 | 47 | 2 | 15.3 | 82 | 3 |
| D 6580 | | 61.5 | 35.6 | 25 | 72 | 3 | 15.2 | 91 | 3 |
| D 6586 | | 62.5 | 40.3 | 47 | 52 | 1 | 14.9 | 83 | 3 |
| D 6654 | | 62.5 | 43.5 | 60 | 39 | 1 | 14.9 | 80 | 2 |
| D 6659 | | 61.5 | 38.9 | 39 | 59 | 2 | 15.3 | 84 | 3 |
| D 6687 | | 61.0 | 37.7 | 38 | 58 | 4 | 15.5 | 84 | 3 |
| Adur x Wells | | 57.5 | 36.9 | 31 | 63 | 6 | 15.5 | 70 R | 1 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable. R - Red.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.

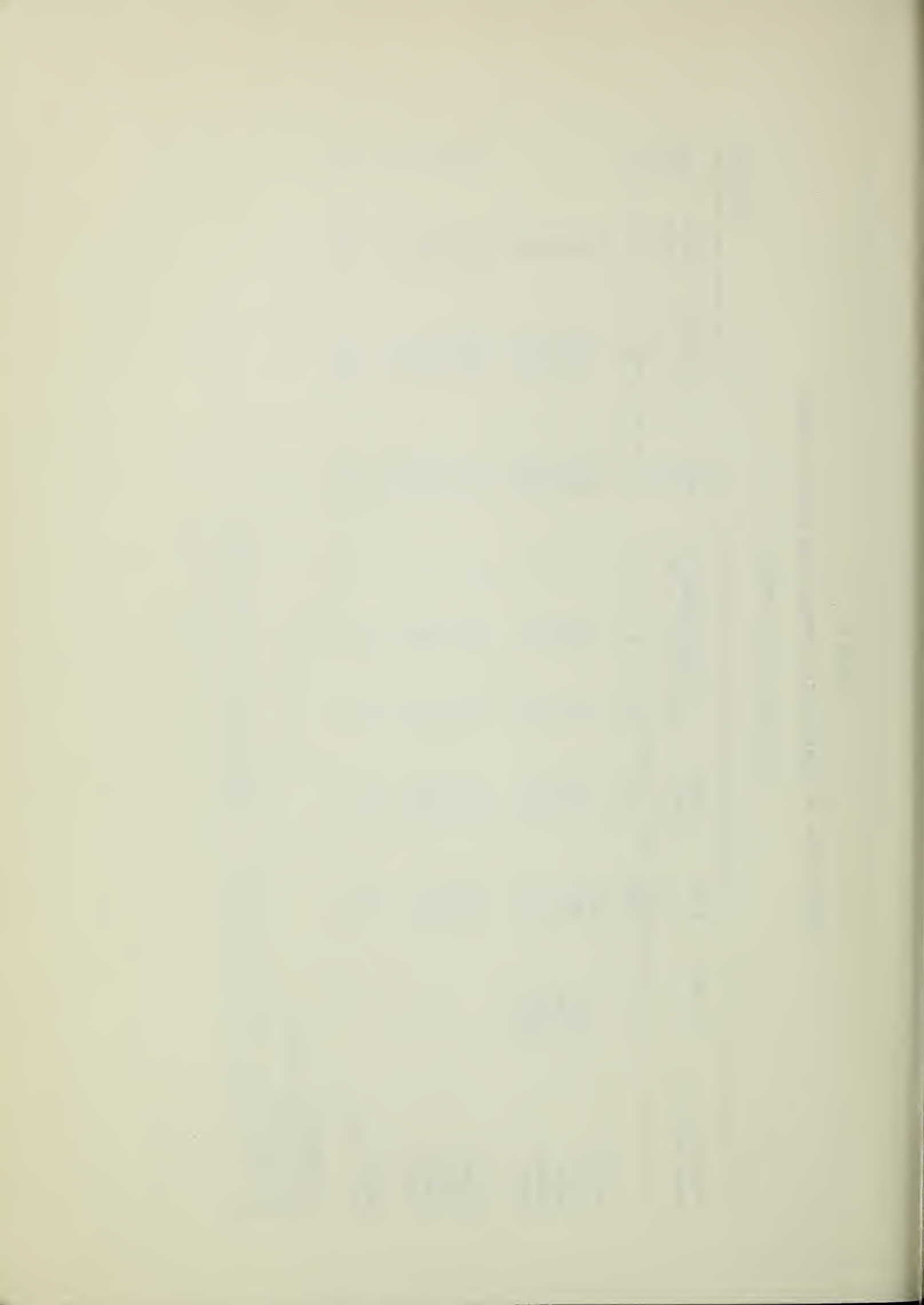


TABLE 3

QUALITY DATA ON ADVANCED YIELD DURUM WHEAT NURSERY SAMPLES

Pendleton, Oregon

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ % | Gen. Eval. 5/ % |
|------------------------------|----------|---------------------|--------------|-------------|----------|-------------------------|---------------------|---------------------------|--------------------------|
| | | | | Lg. | Med. Sm. | | | | |
| | | | g. | % | % | % | | | |
| Lakota | 13335 | 62.0 | 34.1 | 21 | 75 | 4 | 57.6 | 86 | |
| Langdon | 13165 | 63.0 | 43.5 | 57 | 41 | 2 | 60.6 | 71 | |
| Leeds | 13768 | 64.0 | 39.8 | 51 | 48 | 1 | 60.0 | 88 | |
| Wells | 13333 | 63.0 | 33.8 | 30 | 67 | 3 | 57.5 | 83 | |
| 69166 | | 62.5 | 44.1 | 54 | 44 | 2 | 60.5 | 72 | 1 |
| 69167 | | 63.0 | 40.5 | 47 | 50 | 3 | 59.5 | 90 | 4 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



QUALITY DATA ON SOUTH DAKOTA ADVANCED YIELD DURUM WHEAT NURSERY SAMPLES

| Variety or State Sel. No. | C.I. No. | T.W. #/Bu. | 1000 Kwt. | Lg. | % | Kernel Size Lg. Med. Sm. | Wht. Pro. 2/ % | Semolina Score 3/ % | Color Score 4/ R |
|---|----------|-------------------|--------------|-----|----|-----------------------------|----------------------|---------------------------|------------------------|
| Hercules | | 58.0 | 35.0 | 37 | 58 | 5 | 18.1 | 46.6 | 75 R |
| Leeds | 13768 | 60.0 | 33.4 | 27 | 69 | 4 | 17.9 | 47.8 | 84 |
| Wells | 13333 | 58.0 | 29.6 | 24 | 68 | 8 | 18.4 | 44.9 | 78 R |
| | | | | | | | | | |
| Hercules | | 56.5 | 33.4 | 32 | 63 | 5 | 16.2 | 47.8 | 79 R |
| Leeds | 13768 | 57.0 | 29.3 | 13 | 81 | 6 | 17.2 | 47.1 | 80 R |
| Wells | 13333 | 58.5 | 28.2 | 14 | 79 | 7 | 16.7 | 47.3 | 77 R |
| | | | | | | | | | |
| Hercules | | 61.5 | 40.2 | 50 | 48 | 2 | 15.3 | 50.5 | 79 D ^R |
| Leeds | 13768 | 63.5 | 36.5 | 42 | 56 | 2 | 15.7 | 50.5 | 89 |
| Wells | 13333 | 62.0 | 33.0 | 30 | 66 | 4 | 14.9 | 49.0 | 83 |
| | | | | | | | | | |
| Hercules | | 58.0 | 43.1 | 66 | 33 | 1 | 17.2 | 48.5 | 79 |
| Leeds | 13768 | 62.0 | 40.3 | 52 | 46 | 2 | 17.1 | 48.3 | 83 |
| Wells | 13333 | 61.0 | 33.9 | 26 | 71 | 3 | 16.6 | 46.9 | 77 R |
| | | | | | | | | | |
| Hercules | | 60.5 | 40.3 | 47 | 52 | 1 | 17.9 | 48.1 | 80 |
| Leeds | 13768 | 63.0 | 38.5 | 41 | 58 | 1 | 17.3 | 48.5 | 80 |
| Wells | 13333 | 63.0 | 32.2 | 15 | 82 | 3 | 16.0 | 47.6 | 80 |
| | | | | | | | | | |
| Hercules | | 61.0 | 42.0 | 58 | 40 | 2 | 15.8 | 50.5 | 78 |
| Leeds | 13768 | 61.0 | 35.8 | 37 | 60 | 3 | 16.5 | 50.0 | 85 |
| Wells | 13333 | 60.0 | 32.8 | 26 | 66 | 8 | 16.3 | 48.1 | 78 R |
| | | | | | | | | | |
| 1/ Unofficial | | | | | | | | | |
| 2/ 14% Moisture Basis | | | | | | | | | |
| 3/ Unpurified | | | | | | | | | |
| 4/ Below 80 color score not acceptable. | | | | | | | | | |

Dt - Dirty, R - Red.



TABLE 5

QUALITY DATA ON DURUM FIELD PLOT NURSERY SAMPLES

Carrington, North Dakota

1969 CROP

| Variety or State Sel. No. | C. I. No. | T. W. #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. | Sem Pro. | Pur. Sem. | Ash 2/ | Specks/ 10 Sq. In. | Sem. Abs. | Vis. Color | Gen. Eval. |
|------------------------------|-----------|----------------|--------------|-------------|----------|--------------|-------------|--------------|-----------|-----------------------|--------------|---------------|---------------|
| | | | | Lg. | Med. Sm. | | | | | | | | |
| | | | g. | % | % | 2/ | % | 3/ | 2/ | | 2/ | 4/ | 5/ |
| Hercules | | 61.1 | 43.7 | 61 | 36 | 3 | 13.0 | 53.5 | .69 | 27 | 32.0 | 10.0 | |
| Lakota | 13335 | 59.0 | 36.1 | 26 | 69 | 5 | 13.6 | 52.5 | .65 | 30 | 32.0 | 10.0 | |
| Leeds | 13768 | 62.5 | 41.0 | 53 | 43 | 4 | 14.9 | 53.6 | .69 | 27 | 32.0 | 9.5 | |
| Mindum | 5296 | 61.7 | 43.5 | 54 | 43 | 3 | 12.9 | 53.3 | .59 | 20 | 32.0 | 8.5 | |
| Wells | 13333 | 60.8 | 35.5 | 31 | 64 | 5 | 13.9 | 52.2 | .67 | 23 | 32.0 | 8.5 | |
| D 6517 | | 62.0 | 43.5 | 56 | 42 | 2 | 14.3 | 53.3 | .63 | 27 | 32.0 | 9.5 | 4 |
| D 6580 | | 60.2 | 41.3 | 52 | 44 | 4 | 13.8 | 53.5 | .67 | 33 | 32.0 | 10.0 | 4 |
| D 6586 | | 62.2 | 41.3 | 48 | 48 | 4 | 13.7 | 54.7 | .67 | 27 | 32.0 | 9.0 | 3 |
| D 6654 | | 61.1 | 46.5 | 63 | 34 | 3 | 13.6 | 53.7 | .69 | 33 | 32.0 | 8.0 | 2 |
| D 6659 | | 61.0 | 44.4 | 59 | 37 | 4 | 13.9 | 53.3 | .68 | 30 | 32.0 | 8.5 | 3 |
| D 6687 | | 59.4 | 41.0 | 50 | 46 | 4 | 14.4 | 52.4 | .65 | 27 | 32.0 | 10.0 | 3 |
| Adur x Wells | | 60.6 | 39.8 | 44 | 53 | 3 | 13.8 | 51.2 | .71 | 33 | 32.0 | 7.0 | 1 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Purified

4/ Below 8 color score not acceptable.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



QUALITY DATA ON DURUM FIELD PLOT NURSERY SAMPLES

Dickinson, North Dakota

1969 CROP

[illegible]

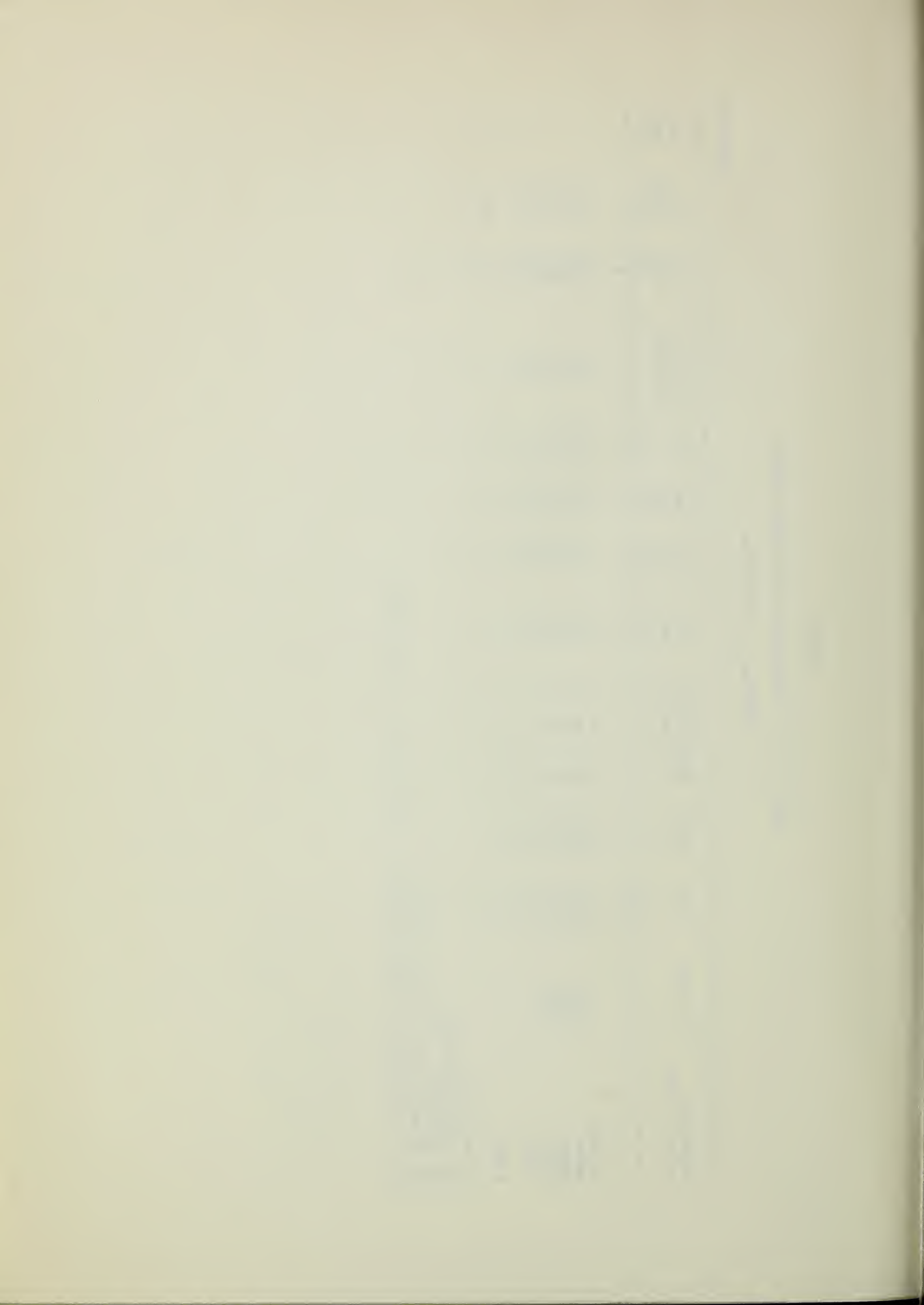


TABLE 7

QUALITY DATA ON DURUM FIELD PLOT NURSERY SAMPLES

Williston, North Dakota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ | Sem. Pro. 2/ | Pur. Sem. 3/ | Ash 2/ | Specks/ 10 Sq.In. | Sem. Abs. 2/ | Vis. Color 4/ | Gen. Eval. 5/ |
|------------------------------|----------|---------------|--------------|-------------|----------|--------------------|--------------------|--------------------|-----------|----------------------|--------------------|---------------------|---------------------|
| | | | | Lg. | Med. Sm. | | | | | | | | |
| | | | g. | % | % | % | % | % | % | % | % | | |
| Hercules | | 62.0 | 38.9 | 37 | 60 | 3 | 14.4 | 13.4 | 52.6 | .71 | 20 | 32.0 | |
| Leeds | 13768 | 63.7 | 34.6 | 13 | 82 | 5 | 15.8 | 14.3 | 52.1 | .77 | 33 | 32.0 | |
| Mindum | 5296 | 64.1 | 34.4 | 13 | 81 | 6 | 15.0 | 13.6 | 52.2 | .66 | 27 | 32.0 | |
| Wells | 13333 | 62.7 | 29.8 | 8 | 85 | 7 | 15.0 | 14.2 | 50.1 | .75 | 23 | 32.0 | |
| D 6517 | | 62.4 | 38.2 | 32 | 65 | 3 | 15.0 | 13.9 | 53.2 | .68 | 27 | 32.0 | 4 |
| D 6580 | | 61.6 | 33.9 | 13 | 81 | 6 | 14.3 | 13.3 | 52.4 | .72 | 23 | 32.0 | 4 |
| D 6586 | | 63.4 | 36.2 | 17 | 78 | 5 | 13.6 | 12.6 | 54.7 | .67 | 20 | 32.0 | 3 |
| D 6654 | | 62.6 | 37.6 | 14 | 81 | 5 | 13.4 | 12.2 | 54.3 | .69 | 23 | 32.0 | 2 |
| D 6659 | | 62.9 | 37.5 | 13 | 82 | 5 | 13.1 | 12.1 | 52.9 | .65 | 20 | 32.0 | 3 |
| D 6687 | | 60.9 | 35.0 | 20 | 74 | 6 | 14.5 | 13.6 | 52.9 | .72 | 30 | 32.0 | 3 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Purified

4/ Below 8 color score not acceptable.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise

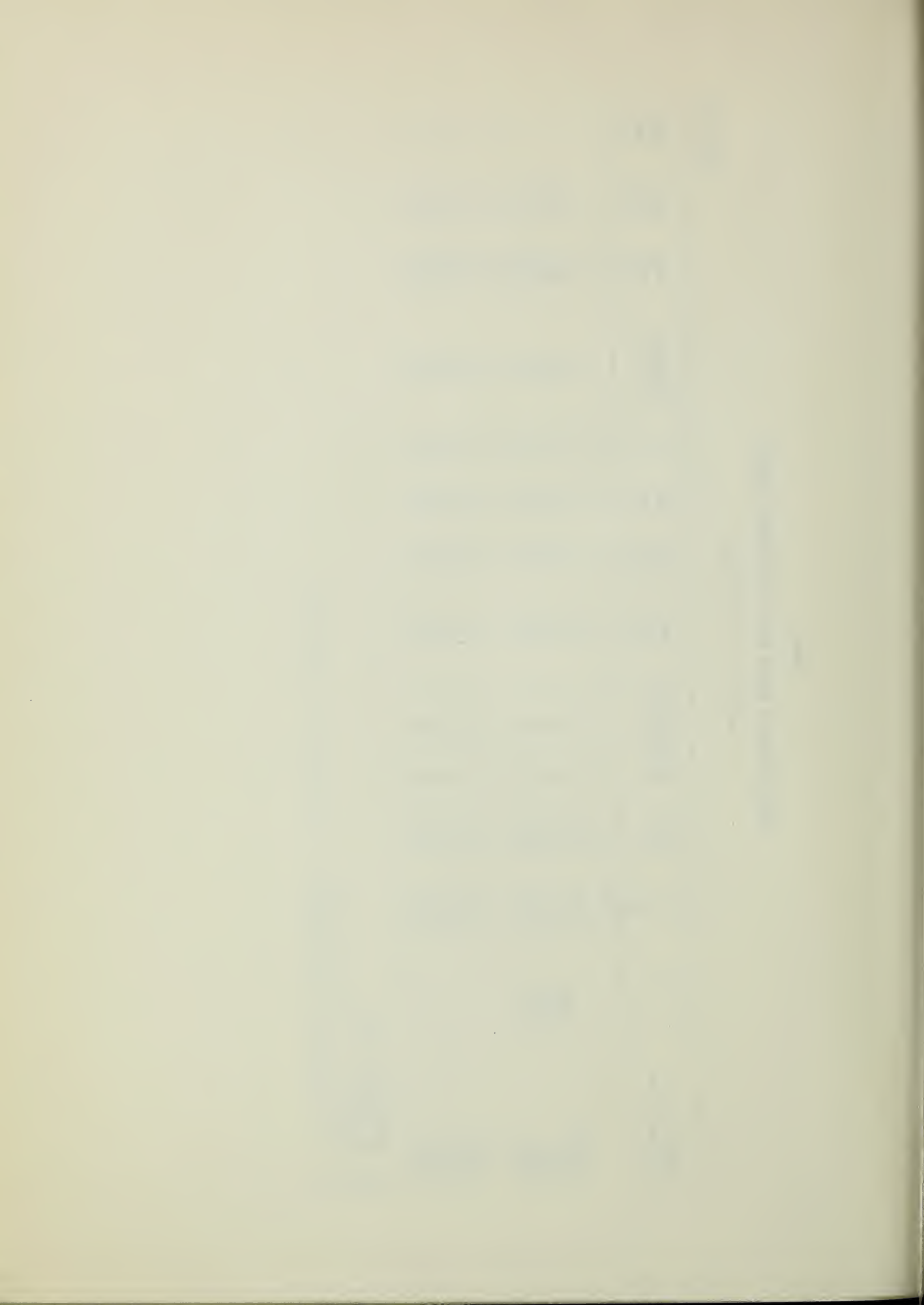


TABLE 8

QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

Crookston, Minnesota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ 5/ | Gen. Eval. 5/ |
|------------------------------|----------|---------------------|--------------|-------------|------|-------------------------|---------------------|----------------------------|---------------------|
| | | | | Lg. | Med. | | | | |
| | | | g. | % | % | % | % | | |
| Hercules | | 63.0 | 45.0 | 67 | 32 | 1 | 49.7 | 77 | |
| Leeds | 13768 | 63.5 | 42.2 | 63 | 37 | 0 | 47.6 | 81 | |
| Mindum | 5296 | 64.5 | 38.8 | 41 | 57 | 2 | 49.3 | 72 W | |
| Wells | 13333 | 64.0 | 38.3 | 43 | 55 | 2 | 46.3 | 80 | |
| DT 316 | | 63.0 | 40.8 | 50 | 49 | 1 | 46.3 | 78 | 1 |
| DT 317 | | 62.0 | 43.1 | 60 | 39 | 1 | 47.6 | 85 | 4 |
| D 6517 | | 64.0 | 46.3 | 62 | 37 | 1 | 50.3 | 77 | 1 |
| D 6580 | | 62.5 | 42.6 | 55 | 43 | 2 | 48.3 | 87 | 4 |
| D 6586 | | 64.0 | 42.2 | 61 | 38 | 1 | 48.3 | 82 | 4 |
| D 6647 | | 63.5 | 44.2 | 65 | 34 | 1 | 47.7 | 76 | 1 |
| D 6654 | | 63.0 | 43.9 | 69 | 29 | 2 | 47.2 | 74 | 1 |
| D 6655 | | 63.0 | 47.4 | 75 | 24 | 1 | 47.9 | 78 | 1 |
| D 6659 | | 62.5 | 46.3 | 70 | 29 | 1 | 46.5 | 77 | 1 |
| D 6660 | | 62.5 | 46.7 | 69 | 29 | 2 | 47.2 | 77 | 1 |
| D 6674 | | 62.5 | 43.5 | 59 | 39 | 2 | 45.1 | 84 | 4 |
| D 6676 | | 64.5 | 44.6 | 65 | 34 | 1 | 47.2 | 86 | 4 |
| D 6678 | | 62.5 | 43.1 | 64 | 35 | 1 | 46.3 | 81 | 4 |
| D 6687 | | 62.5 | 41.8 | 60 | 39 | 1 | 46.5 | 85 | 4 |
| D 6688 | | 64.0 | 41.0 | 59 | 40 | 1 | 46.5 | 82 | 4 |
| D 6690 | | 63.5 | 37.5 | 48 | 51 | 1 | 47.2 | 81 | 3 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable. W - White.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.

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TABLE 9

QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

Morris, Minnesota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ % | Gen. Eval. 5/ % |
|------------------------------|----------|---------------|--------------|-------------|------|-------------------------|---------------------|---------------------------|--------------------------|
| | | | | Lg. | Med. | | | | |
| | | | g. | % | % | % | % | | |
| Hercules | | 62.5 | 43.1 | 53 | 46 | 1 | 13.5 | 41.4 | 81 |
| Leeds | 13768 | 64.5 | 40.2 | 51 | 48 | 1 | 14.1 | 41.6 | 84 |
| Mindum | 5296 | 63.0 | 32.9 | 9 | 86 | 5 | 10.6 | 44.4 | 81 |
| Wells | 13333 | 63.5 | 33.6 | 21 | 75 | 4 | 12.6 | 41.8 | 82 |
| DT 316 | | 63.0 | 39.1 | 23 | 76 | 1 | 13.2 | 43.0 | 82 |
| DT 317 | | 61.0 | 40.8 | 49 | 49 | 2 | 13.5 | 43.0 | 84 |
| D 6517 | | 63.5 | 42.9 | 57 | 42 | 1 | 13.7 | 45.0 | 79 |
| D 6580 | | 62.0 | 36.6 | 35 | 62 | 3 | 13.6 | 42.7 | 87 |
| D 6586 | | 64.0 | 38.9 | 34 | 65 | 1 | 12.6 | 41.7 | 84 |
| D 6647 | | 62.5 | 42.9 | 52 | 46 | 2 | 15.0 | 42.0 | 80 |
| D 6654 | | 61.0 | 39.4 | 46 | 52 | 2 | 14.6 | 40.4 | 80 |
| D 6655 | | 61.0 | 39.2 | 36 | 62 | 2 | 13.7 | 40.4 | 82 |
| D 6659 | | 61.5 | 43.1 | 55 | 42 | 3 | 15.0 | 41.7 | 80 |
| D 6660 | | 61.5 | 41.7 | 51 | 47 | 2 | 14.8 | 42.4 | 79 |
| D 6674 | | 63.5 | 40.7 | 55 | 44 | 1 | 13.4 | 42.4 | 86 |
| D 6676 | | 64.0 | 41.0 | 55 | 44 | 1 | 13.3 | 42.7 | 85 |
| D 6678 | | 62.0 | 36.8 | 34 | 64 | 2 | 13.6 | 41.7 | 84 |
| D 6687 | | 62.5 | 37.2 | 40 | 59 | 1 | 14.1 | 41.7 | 86 |
| D 6688 | | 63.0 | 36.9 | 39 | 58 | 3 | 13.9 | 40.7 | 83 |
| D 6690 | | 63.5 | 36.5 | 39 | 60 | 1 | 14.2 | 41.1 | 81 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.

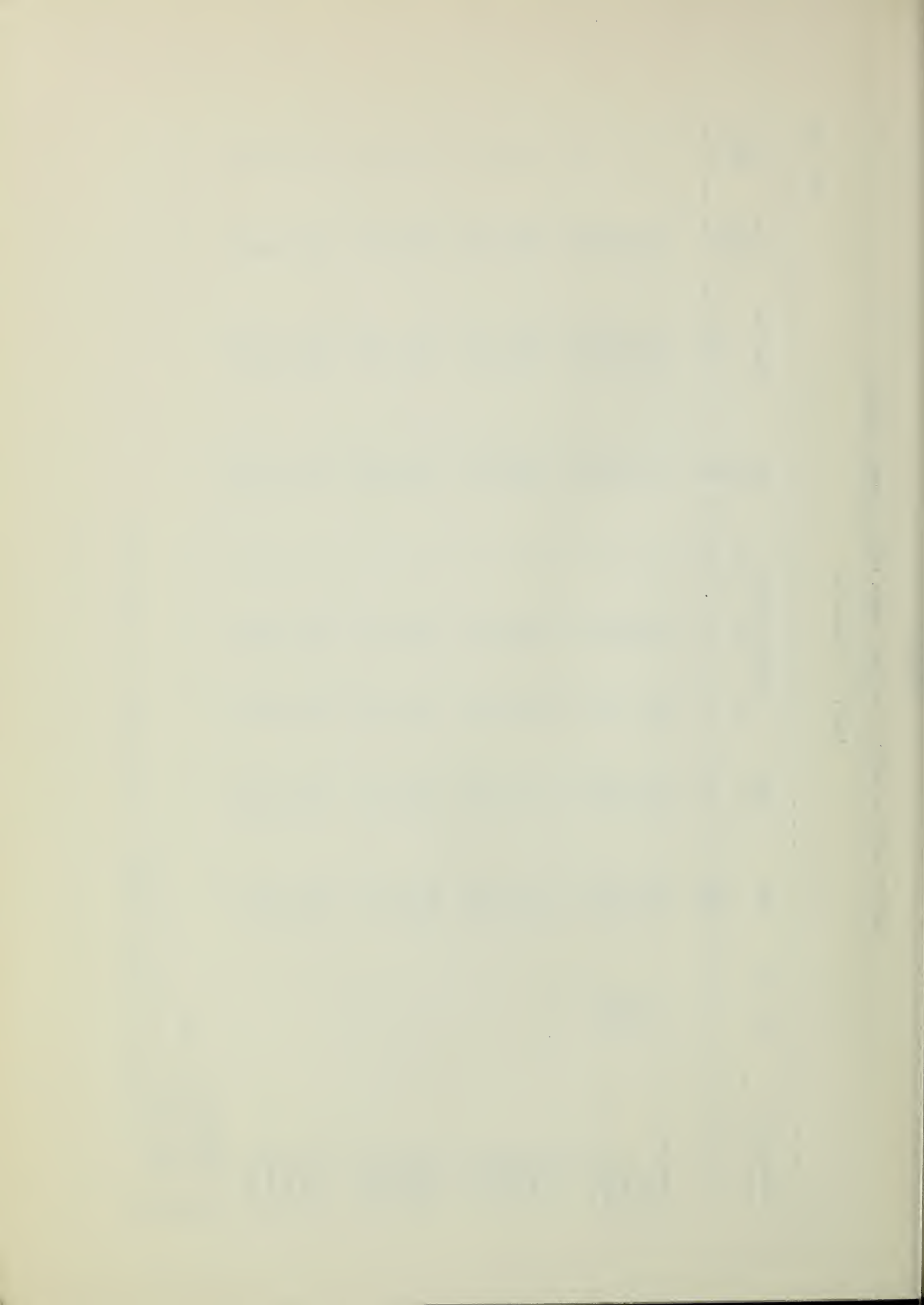


TABLE 10

QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

St. Paul, Minnesota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ % | Gen. Eval. 5/ % |
|------------------------------|----------|---------------------|--------------|-------------|----------|-------------------------|---------------------|---------------------------|--------------------------|
| | | | | Lg. | Med. Sm. | | | | |
| | | | g. | % | % | | | | |
| Hercules | | 58.5 | 42.9 | 70 | 29 | 13.2 | 42.3 | 75 | |
| Leeds | 13768 | 61.0 | 37.6 | 54 | 45 | 14.3 | 39.4 | 77 | |
| Mindum | 5296 | 62.5 | 38.5 | 58 | 41 | 12.9 | 44.0 | 70 W | |
| Wells | 13333 | 60.5 | 36.6 | 51 | 47 | 13.1 | 40.7 | 70 W | |
| DT 316 | | 59.0 | 37.9 | 49 | 50 | 14.1 | 39.0 | 78 | 3 |
| DT 317 | | 58.0 | 40.5 | 67 | 32 | 14.0 | 38.8 | 78 | 3 |
| D 6517 | | 58.0 | 42.0 | 62 | 37 | 15.1 | 38.7 | 70 G | 1 |
| D 6580 | | 57.5 | 39.2 | 58 | 41 | 14.3 | 38.7 | 78 | 2 |
| D 6586 | | 60.0 | 39.5 | 56 | 43 | 13.3 | 39.1 | 75 | 1 |
| D 6647 | | 58.5 | 39.8 | 53 | 46 | 13.4 | 40.3 | 70 W | 1 |
| D 6654 | | 58.0 | 40.8 | 56 | 43 | 13.5 | 40.7 | 70 W | 1 |
| D 6655 | | 58.5 | 41.3 | 61 | 38 | 13.0 | 43.2 | 70 W | 1 |
| D 6659 | | 58.5 | 40.8 | 56 | 43 | 13.1 | 39.7 | 70 W | 1 |
| D 6660 | | 58.5 | 43.1 | 61 | 38 | 13.0 | 42.0 | 70 W | 1 |
| D 6674 | | 59.5 | 41.5 | 66 | 33 | 13.1 | 38.7 | 78 | 3 |
| D 6676 | | 60.0 | 40.5 | 62 | 38 | 13.6 | 39.1 | 77 | 3 |
| D 6678 | | 58.0 | 38.5 | 55 | 44 | 14.2 | 37.7 | 76 | 2 |
| D 6687 | | 56.5 | 38.3 | 56 | 43 | 14.7 | 37.6 | 76 | 2 |
| D 6688 | | 56.5 | 37.5 | 52 | 47 | 13.6 | 38.9 | 72 | 1 |
| D 6690 | | 58.0 | 35.6 | 49 | 50 | 13.9 | 37.3 | 70 | 1 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable. G - Gray, W - White.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



TABLE 11

QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

Carrington, North Dakota
(Irrigated)

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ 5/ | Gen. Eval. 5/ 5/ |
|------------------------------|----------|---------------------|--------------|-------------|-------------|-------------------------|---------------------|----------------------------|---------------------------|
| | | | | Lg. | Med. Sm. | | | | |
| | | | g. | % | % | % | % | | |
| Hercules | | 60.5 | 36.2 | 38 | 60 | 2 | | | |
| Leeds | 13768 | 61.5 | 33.9 | 21 | 78 | 1 | 43.3 | 88 | |
| Mindum | 5296 | 59.5 | 30.9 | 9 | 87 | 4 | 41.1 | 94 | |
| Wells | 13333 | 58.5 | 26.0 | 3 | 90 | 7 | 38.4 | 82 | |
| DT 316 | | 57.5 | 29.5 | 8 | 87 | 5 | 37.3 | 93 | 2 |
| | | | | | | | 36.7 | 88 | |
| DT 317 | | 54.0 | 27.5 | 10 | 86 | 4 | 34.0 | 97 | 2 |
| D 6517 | | 60.0 | 30.8 | 9 | 86 | 5 | 40.7 | 88 | 2 |
| D 6580 | | 57.5 | 31.4 | 14 | 82 | 4 | 40.8 | 96 | 4 |
| D 6586 | | 60.0 | 32.3 | 13 | 84 | 3 | 38.4 | 88 | 3 |
| D 6647 | | 62.0 | 36.6 | 31 | 65 | 4 | 42.8 | 85 | 3 |
| D 6654 | | 61.5 | 37.5 | 40 | 58 | 2 | 41.7 | 84 | 3 |
| D 6655 | | 61.5 | 36.5 | 27 | 70 | 3 | 43.0 | 85 | 3 |
| D 6659 | | 61.0 | 35.2 | 18 | 80 | 2 | 41.1 | 83 | 3 |
| D 6660 | | 60.0 | 33.3 | 15 | 82 | 3 | 40.4 | 85 | 3 |
| D 6674 | | 60.0 | 34.7 | 21 | 75 | 4 | 38.7 | 97 | 4 |
| D 6676 | | 62.0 | 36.0 | 27 | 70 | 3 | 42.1 | 92 | 4 |
| D 6678 | | 60.0 | 33.1 | 19 | 78 | 3 | 40.4 | 91 | 4 |
| D 6687 | | 57.5 | 31.7 | 15 | 81 | 4 | 40.4 | 90 | 3 |
| D 6688 | | 60.5 | 33.1 | 20 | 76 | 4 | 42.4 | 91 | 4 |
| D 6690 | | 61.5 | 33.3 | 17 | 80 | 3 | 42.4 | 88 | 3 |
| Adur x Wells | | 58.0 | 36.0 | 34 | 62 | 4 | 35.8 | 65 | 1 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.

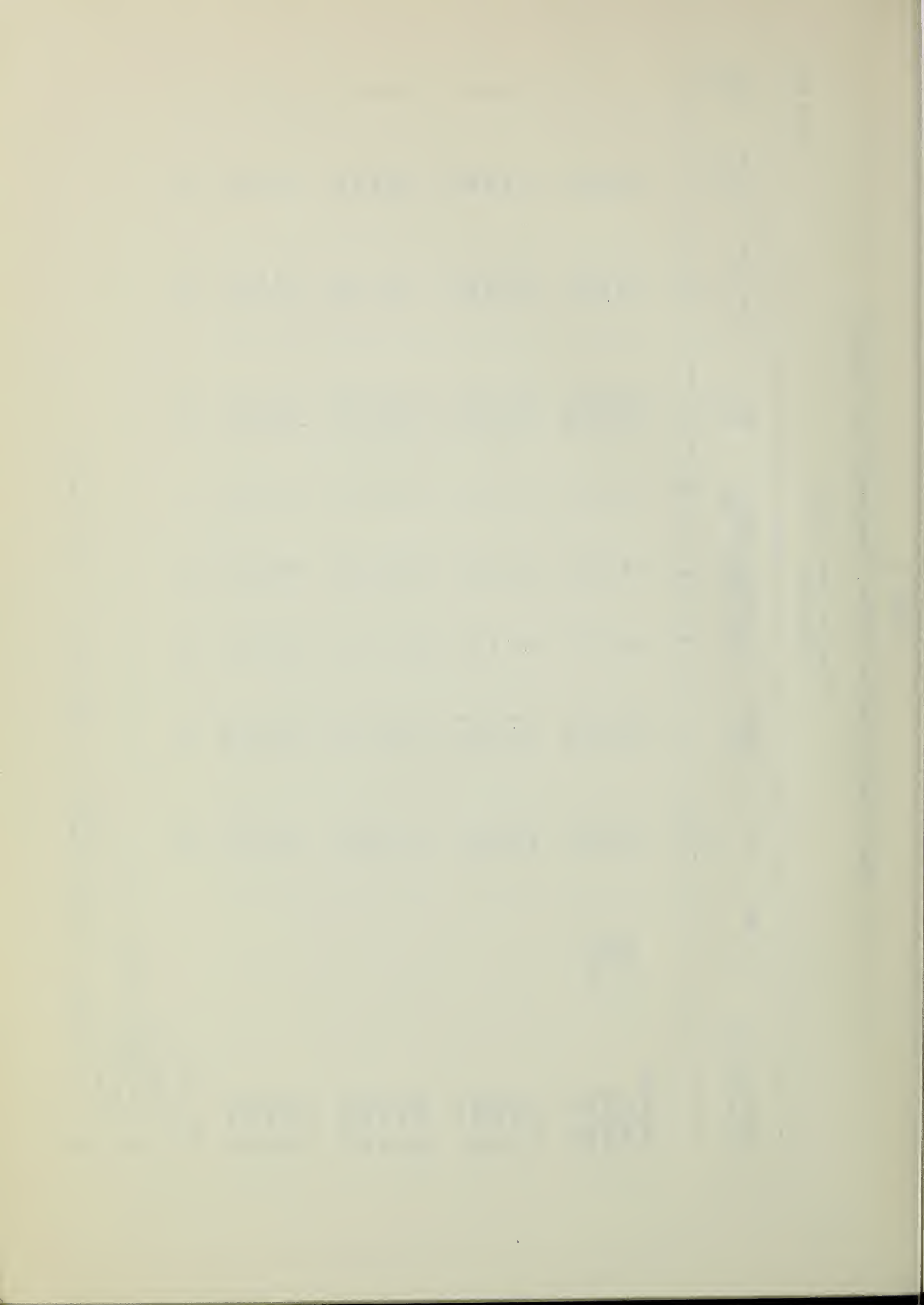


TABLE 12

QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

Dickinson, North Dakota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ 5/ | Gen. Eval. 5/ |
|------------------------------|----------|---------------------|--------------|-------------|------|-------------------------|---------------------|----------------------------|---------------------|
| | | | | Lg. | Med. | | | | |
| | | | g. | % | % | % | % | | |
| Hercules | | 61.5 | 41.5 | 46 | 50 | 4 | 45.8 | 89 | |
| Leeds | 13768 | 63.0 | 40.7 | 54 | 43 | 3 | 46.3 | 84 | |
| Mindum | 5296 | 63.5 | 42.0 | 58 | 40 | 2 | 47.0 | 82 | |
| Wells | 13333 | 62.5 | 38.9 | 45 | 51 | 4 | 44.2 | 86 | |
| DT 316 | | 61.0 | 35.5 | 36 | 58 | 6 | 43.5 | 88 | 3 |
| DT 317 | | 62.0 | 38.2 | 48 | 48 | 4 | 44.4 | 91 | 4 |
| D 6517 | | 62.5 | 39.7 | 41 | 54 | 5 | 43.4 | 88 | 4 |
| D 6580 | | 61.5 | 38.9 | 46 | 48 | 6 | 43.0 | 88 | 3 |
| D 6586 | | 63.0 | 38.9 | 48 | 48 | 4 | 42.5 | 88 | 4 |
| D 6647 | | 62.0 | 39.4 | 49 | 47 | 4 | 43.9 | 85 | 3 |
| D 6654 | | 63.0 | 40.2 | 50 | 46 | 4 | 44.9 | 84 | 4 |
| D 6655 | | 63.5 | 41.8 | 57 | 40 | 3 | 45.4 | 85 | 4 |
| D 6659 | | 63.0 | 40.3 | 51 | 45 | 4 | 44.9 | 84 | 4 |
| D 6660 | | 63.0 | 40.2 | 50 | 47 | 3 | 44.9 | 85 | 4 |
| D 6674 | | 61.5 | 37.9 | 48 | 46 | 6 | 40.7 | 89 | 3 |
| D 6676 | | 62.5 | 38.9 | 47 | 49 | 4 | 44.2 | 89 | 4 |
| D 6678 | | 61.5 | 40.8 | 56 | 40 | 4 | 42.8 | 89 | 4 |
| D 6687 | | 62.0 | 34.2 | 32 | 63 | 5 | 42.8 | 88 | 3 |
| D 6688 | | 62.0 | 38.6 | 46 | 50 | 4 | 42.8 | 89 | 4 |
| D 6690 | | 61.5 | 36.1 | 39 | 58 | 3 | 42.1 | 89 | 3 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ 5/ 5/ | Gen. Eval. |
|--|------------------------|---------------------|--------------|-------------|-----------|-------------------------|---------------------|----------------------------------|---------------|
| | | | | Lg. % | Med. % | | | | |
| Hercules Leeds Mindum Wells DT 316 | 13768 5296 13333 | 60.5 | 38.8 | 36 | 59 | 5 | 42.6 | 76 | |
| | | 61.5 | 35.8 | 31 | 66 | 3 | 41.5 | 85 | |
| | | 59.5 | 30.7 | 6 | 84 | 10 | 40.1 | 75 | |
| | | 60.5 | 30.4 | 15 | 80 | 5 | 40.4 | 75 | |
| | | 60.0 | 34.7 | 17 | 78 | 5 | 41.7 | 82 | 3 |
| DT 317 D 6517 D 6580 D 6586 D 6647 | | 58.5 | 36.5 | 38 | 59 | 3 | 40.7 | 85 | 3 |
| | | 61.0 | 38.3 | 33 | 65 | 2 | 43.5 | 77 | 1 |
| | | 59.0 | 34.0 | 20 | 74 | 6 | 43.3 | 80 | 2 |
| | | 61.5 | 36.2 | 29 | 68 | 3 | 41.4 | 77 | 1 |
| | | 60.5 | 36.5 | 26 | 69 | 5 | 42.2 | 77 | 1 |
| D 6654 D 6655 D 6659 D 6660 D 6674 | | 60.0 | 38.9 | 35 | 61 | 4 | 42.2 | 77 | 1 |
| | | 60.0 | 36.4 | 26 | 71 | 3 | 41.6 | 77 | 1 |
| | | 61.0 | 40.2 | 37 | 60 | 3 | 41.7 | 77 | 1 |
| | | 61.0 | 39.8 | 39 | 59 | 2 | 42.0 | 77 | 1 |
| | | 60.0 | 36.2 | 29 | 67 | 4 | 39.8 | 80 | 2 |
| D 6676 D 6678 D 6687 D 6688 D 6690 | | 61.0 | 33.7 | 25 | 70 | 5 | 42.0 | 81 | 3 |
| | | 60.0 | 36.2 | 33 | 63 | 4 | 40.4 | 79 | 1 |
| | | 59.5 | 35.8 | 33 | 62 | 5 | 42.2 | 81 | 3 |
| | | 60.0 | 34.1 | 29 | 66 | 5 | 40.6 | 80 | 3 |
| | | 60.5 | 33.7 | 23 | 74 | 3 | 40.4 | 83 | 3 |
| 1/ Unofficial | | | | | | | | | |
| 2/ 14% Moisture Basis | | | | | | | | | |
| 3/ Unpurified | | | | | | | | | |
| 4/ Below 80 color score not acceptable. | | | | | | | | | |
| 5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise. | | | | | | | | | |

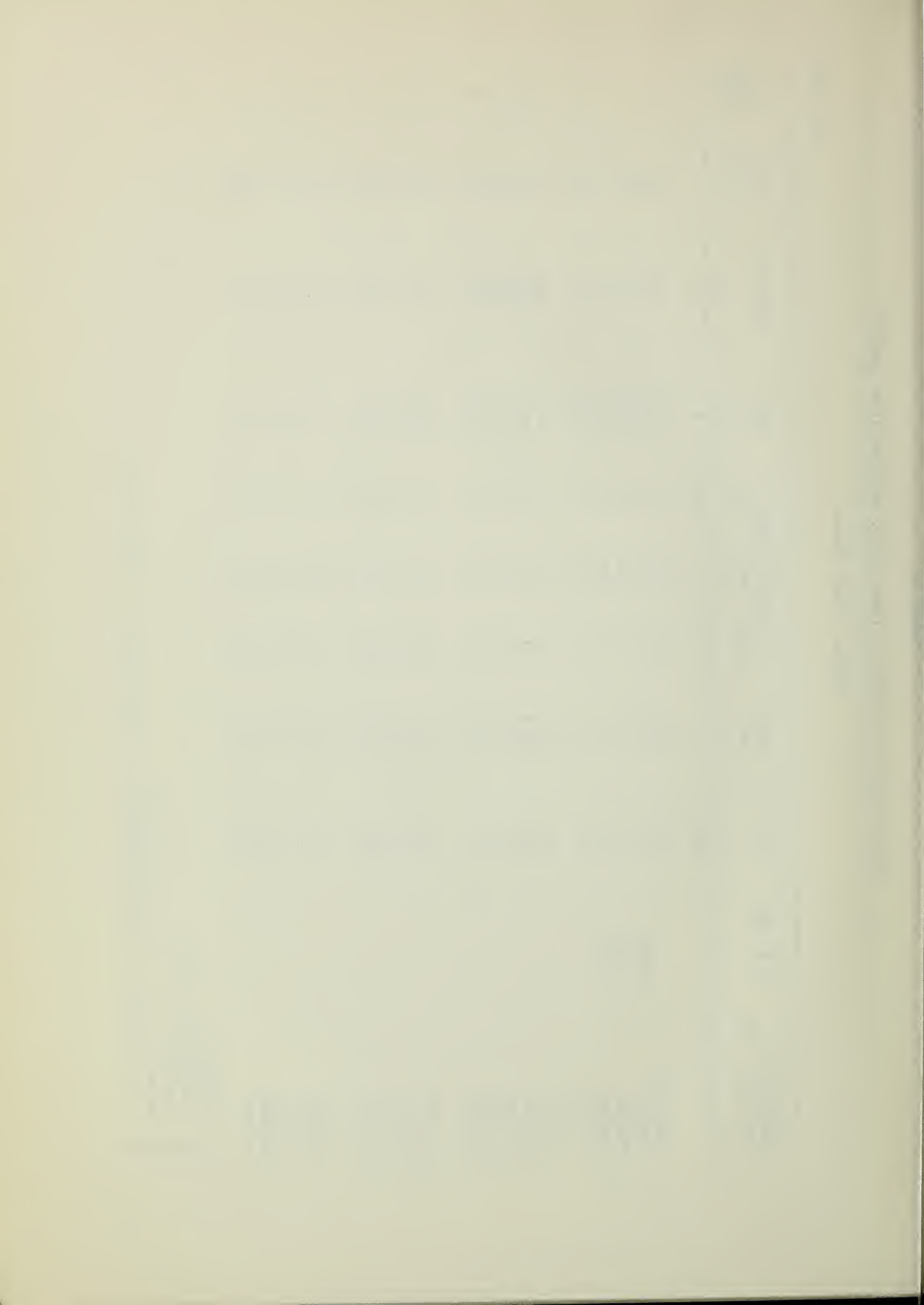


TABLE 14

QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

Watertown, South Dakota

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #/Bu. | 1000 Kwt. g. | Kernel Size | | | Wht. Pro. 2/ % | Semolina 3/ % | Color Score 4/ 5/ | Gen. Eval. 5/ |
|------------------------------|----------|---------------------|--------------------|-------------|------|-----|-------------------------|---------------------|----------------------------|---------------------|
| | | | | Lg. | Med. | Sm. | | | | |
| | | | | % | % | % | | | | |
| Hercules | | 61.0 | 41.5 | 53 | 44 | 3 | 14.9 | 47.6 | 75 | |
| Leeds | 13768 | 61.0 | 36.0 | 35 | 62 | 3 | 15.5 | 45.0 | 80 | |
| Mindum | 5296 | 58.0 | 29.7 | 4 | 86 | 10 | 12.8 | 42.9 | 76 | |
| Wells | 13333 | 60.0 | 33.9 | 23 | 71 | 6 | 15.0 | 42.9 | 78 | |
| DT 316 | | 60.5 | 36.4 | 22 | 73 | 5 | 15.0 | 43.1 | 77 | 1 |
| DT 317 | | 56.0 | 36.5 | 33 | 63 | 4 | 15.5 | 40.7 | 90 | 3 |
| D 6517 | | 59.5 | 40.0 | 41 | 55 | 4 | 15.5 | 43.8 | 72 | 1 |
| D 6580 | | 60.0 | 36.6 | 35 | 61 | 4 | 14.7 | 44.4 | 80 | 3 |
| D 6586 | | 60.5 | 35.5 | 37 | 58 | 5 | 14.7 | 42.9 | 78 | 1 |
| D 6647 | | 59.5 | 36.5 | 26 | 70 | 4 | 14.6 | 44.1 | 78 R | 1 |
| D 6654 | | 60.0 | 37.7 | 35 | 60 | 5 | 14.8 | 44.1 | 75 | 1 |
| D 6655 | | 60.0 | 36.5 | 31 | 65 | 4 | 14.3 | 43.6 | 77 | 1 |
| D 6659 | | 61.0 | 37.6 | 33 | 64 | 3 | 14.6 | 42.6 | 77 | 1 |
| D 6660 | | 60.0 | 39.2 | 37 | 59 | 4 | 14.9 | 44.7 | 76 R | 1 |
| D 6674 | | 60.5 | 37.9 | 35 | 60 | 5 | 14.8 | 40.7 | 82 | 3 |
| D 6676 | | 60.5 | 35.7 | 32 | 65 | 3 | 15.0 | 42.8 | 82 | 3 |
| D 6678 | | 55.5 | 32.2 | 17 | 76 | 7 | 15.8 | 39.4 | 78 R | 1 |
| D 6687 | | 60.0 | 36.5 | 38 | 59 | 3 | 15.1 | 40.7 | 82 | 3 |
| D 6688 | | 60.0 | 35.8 | 33 | 63 | 4 | 15.0 | 40.4 | 79 | 1 |
| D 6690 | | 59.0 | 34.2 | 23 | 73 | 4 | 14.9 | 43.3 | 79 | 1 |

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable. R - Red.

5/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.

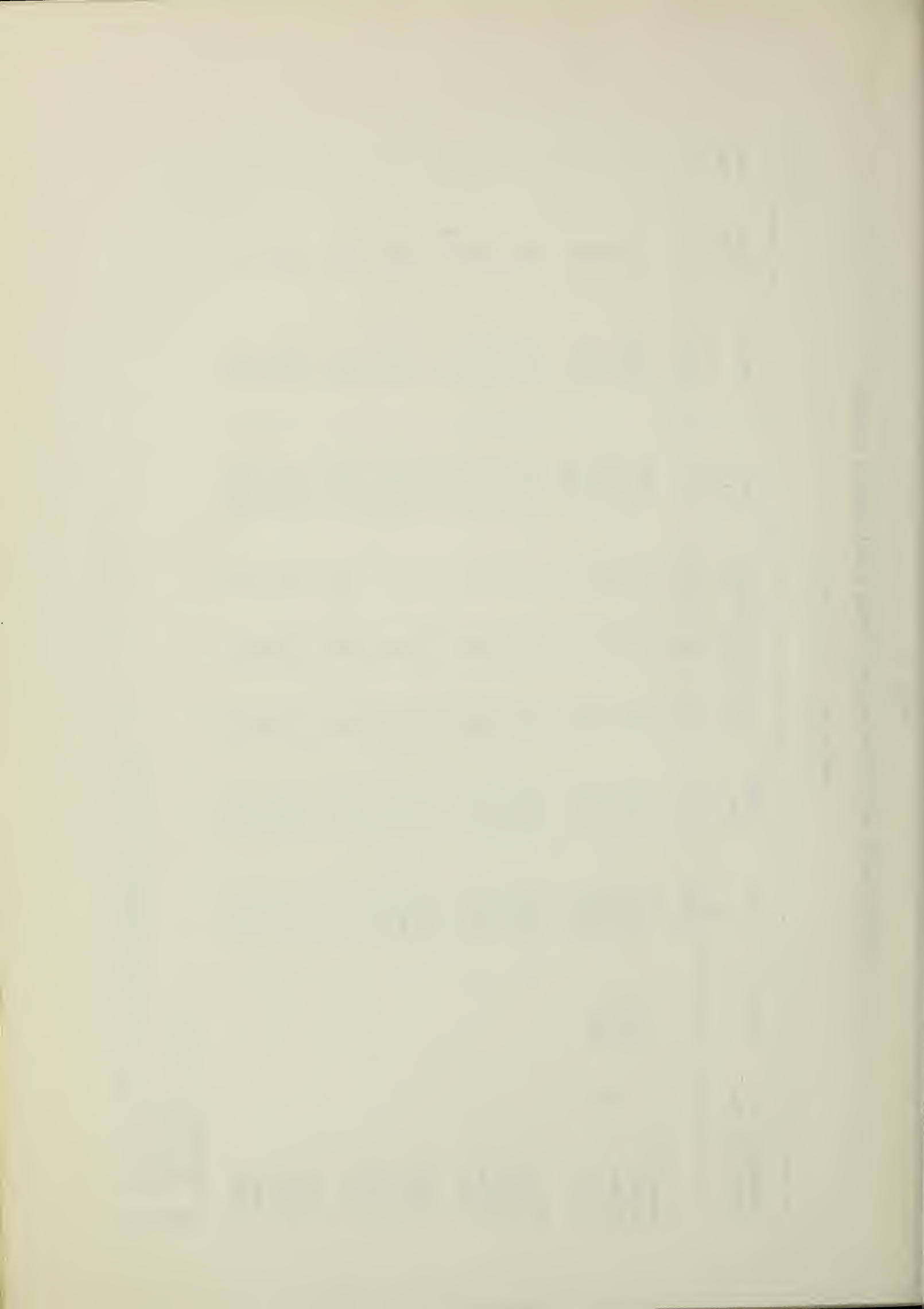


TABLE 15

QUALITY DATA ON SPECIAL DURUM WHEAT NURSERY SAMPLES

Othello, Washington

1969 CROP

| Variety or State Sel. No. | C.I. No. | T.W. 1/ #Bu. | 1000 Kwt. | Kernel Size | | Wht. Pro. 2/ % | Sem. Pro. 2/ % | Pur. Sem. 3/ % | Ash | | Specks/ 10 Sq.In. | Sem. Abs. 2/ % | Vis. Color 4/ % | Gen. Eval. 5/ % |
|------------------------------|----------|--------------------|--------------|-------------|----------|-------------------------|-------------------------|-------------------------|---------|---------|----------------------|-------------------------|--------------------------|--------------------------|
| | | | | Lg. | Med. Sm. | | | | | | | | | |
| | | | g. | % | % | % | % | % | 2/ % | 2/ % | | | | |
| Lakota | 13335 | 63.5 | 37.9 | 55 | 41 | 4 | 13.3 | 11.7 | 55.6 | .58 | 27 | 34.7 | 8.5 | |
| Langdon | 13165 | 65.0 | 49.3 | 73 | 25 | 2 | 13.1 | 11.7 | 58.9 | .60 | 20 | 33.3 | 8.5 | |
| Leeds | 13768 | 65.5 | 46.1 | 73 | 27 | 0 | 13.4 | 11.7 | 56.3 | .60 | 23 | 33.3 | 8.5 | |
| Sentry | 13102 | 64.5 | 43.5 | 60 | 39 | 1 | 13.8 | 12.3 | 50.0 | .57 | 23 | 33.3 | 8.5 | |
| Wells | 13333 | 64.5 | 35.5 | 37 | 60 | 3 | 13.6 | 12.3 | 56.3 | .56 | 30 | 33.7 | 8.5 | |
| WA 005288 | | 65.0 | 40.5 | 46 | 52 | 2 | 11.2 | 9.7 | 56.3 | .58 | 33 | 34.3 | 8.0 | 2 |
| WA 005289 | | 63.0 | 41.2 | 31 | 67 | 2 | 12.3 | 10.7 | 56.1 | .60 | 23 | 33.7 | 8.5 | 3 |
| WA 005290 | | 62.0 | 36.4 | 31 | 65 | 4 | 12.9 | 11.5 | 56.7 | .59 | 13 | 34.0 | 9.5 | 4 |
| WA 005463 | | 62.5 | 33.0 | 11 | 82 | 7 | 12.4 | 11.1 | 56.1 | .59 | 37 | 34.3 | 9.5 | 3 |
| WA 005544 | | 63.5 | 31.5 | 7 | 85 | 8 | 13.2 | 11.7 | 55.8 | .57 | 17 | 33.7 | 9.5 | 3 |
| M 6300018 | | 66.0 | 42.2 | 59 | 40 | 1 | 12.7 | 11.2 | 56.0 | .54 | 23 | 34.0 | 8.5 | 3 |
| M 6300037 | | 63.0 | 39.5 | 37 | 60 | 3 | 13.1 | 11.4 | 54.9 | .62 | 23 | 34.3 | 8.5 | 3 |
| WA 005462 | | 64.0 | 37.0 | 41 | 57 | 2 | 13.0 | 11.6 | 55.6 | .56 | 27 | 34.3 | 8.5 | 3 |
| D 6300008 | | 62.5 | 37.2 | 24 | 71 | 5 | 14.6 | 13.2 | 54.4 | .60 | 23 | 33.7 | 8.5 | 3 |
| NDD 06639 | | 65.5 | 47.6 | 70 | 29 | 1 | 13.6 | 11.8 | 54.8 | .64 | 23 | 33.3 | 8.0 | 2 |
| NDD 06644 | | 66.5 | 54.1 | 87 | 13 | 0 | 12.9 | 11.4 | 55.8 | .56 | 20 | 33.3 | 8.0 | 2 |
| NDD 06647 | | 65.5 | 43.9 | 52 | 45 | 3 | 12.3 | 11.0 | 56.5 | .52 | 20 | 34.0 | 8.5 | 3 |
| NDD 06655 | | 65.0 | 43.1 | 62 | 37 | 1 | 12.9 | 11.5 | 57.4 | .54 | 23 | 34.3 | 8.5 | 3 |
| NDD 06659 | | 65.0 | 44.6 | 57 | 42 | 1 | 12.2 | 10.9 | 57.1 | .55 | 23 | 34.3 | 8.5 | 3 |
| NDD 06660 | | 64.5 | 45.0 | 55 | 43 | 2 | 12.6 | 11.1 | 56.9 | .58 | 20 | 34.0 | 8.5 | 3 |
| NDD 66102 | | 63.5 | 42.6 | 67 | 32 | 1 | 12.6 | 10.9 | 55.1 | .53 | 27 | 33.0 | 8.0 | 2 |
| K 6800702 | | 65.0 | 50.5 | 78 | 21 | 1 | 12.8 | 11.4 | 56.2 | .55 | 23 | 33.0 | 7.5 | 1 |
| K 6800703 | | 65.5 | 48.3 | 80 | 20 | 0 | 11.9 | 10.2 | 58.1 | .55 | 27 | 33.0 | 8.5 | 3 |
| K 6800707 | | 65.5 | 43.3 | 62 | 37 | 1 | 13.0 | 11.7 | 56.9 | .56 | 27 | 33.0 | 9.5 | 4 |
| K 6800708 | | 64.5 | 41.8 | 62 | 38 | 0 | 14.1 | 12.8 | 56.2 | .53 | 23 | 33.3 | 8.5 | 3 |
| K 6800714 | | 63.5 | 45.0 | 63 | 36 | 1 | 12.7 | 11.0 | 55.6 | .48 | 13 | 34.3 | 8.0 | 2 |
| K 6800717 | | 64.5 | 50.5 | 77 | 23 | 0 | 10.4 | 9.0 | 56.0 | .54 | 30 | 33.7 | 7.5 | 1 |
| K 6800718 | | 64.0 | 40.3 | 59 | 40 | 1 | 11.3 | 10.0 | 56.2 | .50 | 33 | 33.7 | 8.0 | 2 |
| K 6800719 | | 65.5 | 54.6 | 90 | 10 | 0 | 11.7 | 10.1 | 54.4 | .50 | 27 | 35.3 | 8.5 | 3 |
| K 6800726 | | 63.5 | 47.4 | 68 | 31 | 1 | 11.6 | 10.2 | 55.3 | .57 | 30 | 33.3 | 7.5 | 1 |

(CONT'D.)

